..THE IRON AGE..

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"BANKOCRACY"—An Industrial Answer to "TECHNOCRACY"

By G. L. LACHER

WE have the plants anxious to produce and we have the people eager to consume, but both production and consumption are at record low levels. What is the matter? A chorus of voices, including those of Socialists and Communists, politicians and financiers, academicians and "technocrats," gives us a common answer: "Production is at fault." With monotonous frequency we are told that production creates technological unemployment, that production is without plan.

The remedies offered by these critics are various, but most of them call for further coordination and synchronization of the component parts of our industrial system. Whether the recommendation be price control through revision of our anti-trust acts, larger corporate consolidations, Government ownership of the means of production, fascism after the Mussolini pattern, communism a la Stalin, or technocracy according to Howard Scott, it invariably points in one direction—toward further restriction of competitive industrial enterprise.

The Evils of Excessive Industrial Centralization

It is true that individual and group freedom have undergone steady suppression as civilization has progressed. Politically and economically man has gradually given up more and more of his liberty of action for the sake of larger social benefits. Theoretically, it seems only logical that he should go the whole distance and submerge all of his rights in the interests of the common good. But extreme centralization of authority, whether it be economic or political or both, inevitably results in excessive centralization of power. And eventually such power is always abused, whether the possessors be of high or low degree. We need only cast our eyes toward Russia to get an idea of what extreme economic centralization means in practice—a huge, inefficient and wasteful bureaucracy with tyranny at the top. Economic autocracy can be just as odious as political oppression, which drove so many lovers of freedom from the Old World to our shores.

To illustrate what has happened in Russia it is only necessary to cite a recent conversation between a Russian workman and a foreign engineer. The workman, a former peasant, said: "It is not generally realized abroad that the real winners of the Bolshevik revolution were the peasants. They won freedom, land and bread, but now all three have been taken away from them." When asked about the lot of Russian industrial workers, he said that they lacked much, but what they wanted most was "freedom of work" and "freedom of movement."

It is the custom these days to disparage freedom, "rugged" individualism and private incentive, but nevertheless it must not be forgotten that our great industries have grown up in the soil of free enterprise. And those great industries have to their credit that they raised the standard of living to the highest level in the experience of man.

Industry Was Caught Napping

After all, why should an industrial system which produced so much for the benefit of so many be so generally blamed for the present crisis? Why is it that industry's tool, the machine, is so generally condemned?

Perhaps the best answer is that men who have been engrossed in problems of technique and production are inarticulate when it comes to the discussion of broad economic problems. Professors, bankers, politicians and journalists are experienced and skilled in the art of economic phrase-making, so skilled in fact as to convert many industrialists to their views. It was only when the technocrats made the front pages of the newspapers that men of industry were aroused from their lethargy. They now realize that the question of guilt for the depression can no longer be ignored and that the sooner it is threshed out, without fear or favor, the better it will be for all concerned.

And, with customary engineering approach, they are commencing to do their own studying and their own thinking in the realm of economics. They are no longer accepting the

warmed over opinions of others. Probably the first thing they are learning is that we live in a "credit economy." That sounds like a clue! And, in the opinion of the writer it is a most important clue.

The Real Culprit—the Credit System

MOST of our present ills, variously ascribed to overproduction, technological unemployment, price maladjustments, international and domestic debts, etc., are due fundamentally to the essentially unstable character of our credit system. Before the advent of modern banking, when goods were exchanged for actual specie (silver or gold), prices were affected primarily by the supply of goods and the supply of specie. Today we have an added factor, which alternately greatly expands and sharply contracts the effective supply of money. This is our credit mechanism.

Let us see how the modern bank operates. It is not merely a place for the safe-keeping of money. It is a meeting place for lender and borrower—a place where debts are contracted and corresponding credits are built up. To make the exposition simple, let us assume that A and B each deposit $25,000 in gold in a bank. Each has the right to draw the entire amount on demand. But if we multiply A and B many times, we find that no large part of total deposits is likely to be withdrawn at any one time. For the sake of simplicity, let us assume that the bank just cited regards it safe to lend half of its deposits on a note at interest. If the loan is made to C, who in turn redeposits the sum in the bank, the balance sheet becomes as follows:

Assets		Liabilities	
Gold reserve.	$50,000	Deposit of A	$25,000
Promissory note	25,000	Deposit of B	25,000
		Deposit of C	25,000
	$75,000		$75,000

While the deposits now exceed the cash of the bank, they do not exceed its assets, because the promissory note is backed by an equivalent of cash in property. So long as a bank's loans are arranged to mature in such a way as to maintain a cash reserve sufficient to take care of probable deposit withdrawals there is no serious obstacle to this method of hypothecating property. In fact, banking, as Irving Fisher aptly says, is a device for "coining into dollars land, stoves and other wealth not otherwise generally exchangeable."

How Credit Inflates and Deflates

No one can find fault with such a functioning of banking, because general well-being is promoted by facilitating and increasing the exchange of goods and services. But this does not tell the whole story. Banking lives on interest. When, for any reason, prices begin to rise, interest rates ordinarily advance less rapidly. Hence, a manufacturer or trader can borrow money to produce goods or to buy goods or securities and can sell them later at a profit that exceeds the increase in the price level. (If the profit merely compensated the borrower for the decline in the purchasing power of money he would gain nothing.)

In a period when borrowing is profitable, both bank loans and bank deposits gain in volume and velocity, thereby further encouraging the rise in prices. Finally a point is reached where interest rates overtake the price rise and the advance is halted. Borrowers lose on their transactions and must liquidate additional assets to repay their loans. Liquidation begets liquidation. Price declines beget price declines.

In other words, on the rise the great majority of people are busily engaged converting money into goods, land or securities, because money is declining in purchasing power. Contrariwise, on the decline, there is a rush to convert goods, land or securities into money, because prices are declining and the buying power of money is increasing. As Marshall, the great British economist, put it—"When credit is shaken and prices begin to fall, every one wants to get rid of commodities which are falling in value and to get hold of money which is rapidly rising; this makes prices fall all the faster, and the further fall makes credit shrink even more, and thus for a long time prices fall because prices have fallen."

Credit Dangerously Elastic

IT can be seen, then, that the credit system is dangerously elastic. In a time of rising prices it marshals all forms of tangible property into the effective circulating medium. In a time of deflation it purges itself of this substitute money (hypothecated property) and shrinks toward the base of credit—the actual amount of cash in the banks. Frequently, as in the present depression, the shrinkage goes even below the credit base, i.e., currency in large quantities is withdrawn from the banks and hoarded, or gold is withdrawn by foreign lenders.

The process of deflation is defended as "natural" and "salutary" by reactionary economists, but it is calamitous and damnably unjust. It crushes the weak and enriches the strong. The masses are deprived of work, their homes and their savings. The few who can hold on to a little cash or a few equities are bound to have proportionately larger claims on the wealth of the country when values again appreciate. The great mass of our people are not economists; they have little control over their employment or their incomes. When, as the result of the most drastic deflation in history they are deprived of their life's savings, it cannot be justly said that they are being penalized for their lack of prudence and thrift. The charge that all America indulged in an orgy of extravagance in the 20's is an ugly lie, summoned now to excuse the depredations of the acquisitive. Those "keen" and "shrewd" business men who are now buying the properties of the dispossessed "for a song" are economic vultures. They are taking advantage of a paralysis of our credit system that has no more relation to the normal values of goods and services than death has to life. To be sure, they can find support for their actions in the sage advice of economist wiseacres who say that the only way to start recovery is to deflate to the uttermost bottom. But that remedy will ruin a generation and will stir up more dissatisfaction and dangerous social unrest than technological unemployment multiplied many fold. The machine has taken away jobs but it has provided many more. With a properly controlled credit system, ingenuity and invention would create countless tasks to employ, feed, shelter and clothe men.

Gradual Inflation Salutary

Credit control which would bring about a gradual decline in the purchasing power of money would promote a steady growth in the exchange of goods and services. Possibly new economies in banking practices, as time went on, would take care of that. Possibly more gold than is now being mined is the need, I am not prepared to say. But there is no denying that whenever inflation has taken place naturally and slowly, without being allowed to build up into a great speculative bubble, it has been beneficial.

The cyanide process of recovering gold, together with the discovery of new mines, really pulled us out of the low nineties and provided the impetus for the prosperity of the 1900's.

The discovery of America and the introduction of a large volume of precious metals into the trade of Europe was one of the most important stimuli to the growth of Western civilization in the seventeenth and eighteenth centuries.

The advantage of gradual inflation is that profits, even if in terms of depreciating purchasing power, stimulate business. What is lost in purchasing power per monetary unit is made up for in increased volume and more rapid turnover.

Must Stop Creeping Paralysis of Exchange Medium

ON the other hand, deflation because it prevents profit-making paralyzes trade. Money, after all, is essentially of a token character. It is an acceptable substitute for goods or services. Hence when money is gaining in buying power, people become more interested in accumulating the tokens than the goods the tokens stand for. Some effective way must be found to stop this creeping paralysis of our exchange medium. Of course, steps have been taken by the Federal Reserve authorities which it is hoped will produce the desired results. A large amount of surplus reserve credit has been built up to

(*Concluded on Advertising Page* 10)

Threading Dies — Their Manufacture and Cutting Efficiency — I

By J. G. MORRISON
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THE great variety of tools and dies that industry has accumulated in the last 50 years numbers among them a class rightfully called both tools and dies. Threading dies, or chasers, as they are commonly called, are one of the important time and money-saving tool classifications of our industrial life. Manufactured by necessity to almost gage accuracy, and in many cases actual gage accuracy, these chasers whether one or 48 threads to the inch must be hard and tough enough to accomplish the commercial threading of the gamut of machinable materials.

Today practically all threading dies or chasers are made of high-speed steel. Some little carbon tool steel and oil-hardening tool steel are used for a few special applications. The carbon and oil-hardening types of tool steel are used chiefly on those low-strength, soft and high-heat conductive metals such as copper. Here the ability of the tool to maintain a very keen edge is essential to developing a smooth thread.

High-Speed Steel Best Suited

The 18 per cent tungsten, 4 per cent chromium, and 1 per cent vanadium, or the 18-4-1, type of high-speed steel still stands preeminent as the steel best suited for threading dies. This steel is used in the carbon range of 0.68 to 0.72 per cent for bolt chasers and for some pipe applications; and in the 0.58 to 0.62 carbon range for pipe chasers. Generally speaking, bolt chasers denote the class applied to developing straight threads; pipe chasers, the class applied to developing tapered threads.

Another steel used for pipe chasers contains approximately 18.50 per cent tungsten, 4.25 per cent chromium and 0.60 per cent vanadium. This steel is used in the 0.58 to 0.62 carbon range only. It has proved a relatively tough steel and develops a very good and uniform hardness in this low-carbon range. The 18-4-1 and the low-vanadium types possess the desirable property of not decarburizing readily in the threads during heat treatment or when quenched in air, air blast, oil or hot liquid baths.

The numerous tests that have been made on the various cobalt high-speed steels show them to be inferior to the 18-4-1 type. Cobalt tools must be ground all over after hardening. The chief disadvantages of cobalt high-speed steel for chasers are (1) tendency to decarburization, (2) brittleness, and (3) the ability to hold a cutting edge is not as good as the 18-4-1 type.

The 14 per cent tungsten, 4 per cent chromium and 2 per cent vanadium type and the 18 per cent tungsten, 4 per cent chromium and 2 per cent vanadium type, as well as the various molybdenum types, have not found favor, due more or less to the fact that these steels do not possess the "refractoriness" of the 18-4-1 type. Refractoriness is meant to imply the ability of a steel to undergo heat treatment without the delicate points of the threads becoming decarburized or fused, or losing undue amounts through scaling when heated for hardening or when quenched by any of the various methods that may be used. When one considers that these chasers may be milled to 20, 32 or even 48 threads to the inch and to a sharp 60-deg. angle, are heated from 2250 to 2350 deg. F., and must not lose unduly through fusion or scaling in heat treatment, it would appear just to call a high-speed steel meeting these requirements a refractory high-speed steel.

Carbon is the element giving steel its capacity to harden by heat treatment. It is the chief determining factor in the hardness and brittleness of high-speed steel. Because of this, it is almost imperative in the manufacture of threading dies, if the uniformity of product from month to month is to be maintained, to use a high-speed steel with as restricted a carbon range as possible. This does not mean that a steel having a carbon content outside of a certain specified range would not be suitable for threading tools. However, by using high-speed steels that vary only a little in carbon content from heat to heat, there is better assurance of a final uniform product, and a multiplicity of hardening and tempering treatments is avoided.

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STANDARD high-speed steel still ranks as the best material to meet the exacting demands on threading dies, says the author. He discusses the experience of his company in purchasing uniform material, emphasizing the necessity for uniform carbon content.

In a concluding instalment of this article the effect of nickel on the efficiency of these tools will be fully discussed, as well as the harm due to carburization.

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Steel Bought on Five-Point Carbon Range

In view of the importance the writer's company places on the uniformity of the carbon content of its high-speed steel, the following may be of interest. All high-speed steel used for chasers is purchased to a five-point carbon range. A summary of our bolt chaser steel purchased—0.68 to 0.72 per cent carbon, 0.70 per cent desired—over a period of four and one-half years is given below. On 434 purchase orders calling for 595 sizes or lots, many of course being duplicate sizes, the carbon contents were distributed over the 0.68 to 0.72 per cent carbon range as follows:

0.68	27 lots
0.69	148 lots
0.70	356 lots
0.71	59 lots
0.72	5 lots

It will be seen from the above that 94.6 per cent of all steel used for bolt chasers analyzed within one point of the desired carbon content. Each purchase order size is specified to be made from one heat of steel only. The steel manufacturer supplies a complete analysis of each lot, which is checked by our own laboratory. No tool is permitted to lose its identity from the heat from which it came. Each tool is stamped with combinations of two or three letters, such as, "AA", "AB", or "AAA", "AAB", etc. Each combination of letters represents a heat of high-speed steel.

This system of identifying the tool with the heat number acts as an additional safety valve. Suppose that a heat of steel has been accepted and

(*Concluded on Advertising Page* 12)

Planning and Budgeting During the De

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WIDE fluctuations in business volume and prices make budgeting a difficult problem. But the author, who is director of budgets, Worthington Pump & Machinery Corpn., New York, and director of the New York chapter, National Association of Cost Accountants, declares that the difficulty is not insuperable. He describes a plan under which changes in volume are taken care of by a variable budget of expenses while reductions in sales prices are met by salary and wage cuts, the doubling up of duties, the abandonment of certain routines and the introduction of short-time employment.

SEVERAL months ago at a meeting of a well-known group of executives a controversy occurred on the practicability of making plans for future operations during a period such as the present. The thoughts expressed ranged all the way from a statement that plans could accurately be made for the entire coming year, to a denial that any forecast under present conditions was possible.

To state that an organization can correctly plan its special operations for an entire year is probably as inaccurate as saying that no forecast whatever can be made. But there is no reason why there should not be prepared the best possible estimate of sales, expenses and net income, with the provision, however, that when actual sales vary from the original estimate a different rate of expenses be provided which will be commensurate with the changed rate of sales. As a matter of fact, every individual is obliged to pursue this same course in planning his personal expenses within the limits of his income, whether that income remains fixed or be reduced. And this anticipation of probable expenditures against expected income is budgeting, whether it be for personal expenses or those of an industrial enterprise.

Budgets first became an important factor of control when they were applied to State and municipal finances. Here the expense requirements of the various departments for the ensuing year are compiled and a tax rate set to yield the required income. But industry has had no such comparatively simple problem. It has had to reverse the procedure by estimating its probable income (sales) and then setting expenses at a rate which will permit a reasonable return of profit.

If business conditions were static, it would be a fairly simple matter to determine future income. Unfortunately, the economic pendulum swings widely, causing unexpected peaks and valleys of production, with their resulting high and low prices. Therefore any plans for future operations cannot ignore—

(1)—The possibility of increased or decreased production from that now anticipated.

(2)—The effect of price revisions which may have to be made during the period.

The first of these two conditions is ever present and must be constantly provided for by means of a variable budget. This should be simple and direct, as it involves only the selection of a unit for measuring the activity of a department, and the listing of expenses necessary to process various quantities of the unit.

Determining Expenses for Varying Operating Rates

The unit of output for a department may be yards, pounds, pieces or gallons processed, or it may be direct hours worked. The output of such units measures the volume of work performed. One hundred per cent capacity of any department is usually determined by calculating its possible output if all productive facilities are employed for the full number of working hours per week. These can be stepped down in even percentages of every 5 or 10 per cent to cover the entire range over which it is probable the individual department will be called upon to operate. A form such as that shown, herewith, could be used for accumulating these data. The expenses necessary to produce the quantity of units specified for each operating capacity are then listed. The best plan is to determine the present rate of capacity, review all current expenses incidental to such operation, eliminate unusual expenditures, and reduce all others 5 or 10 per cent as a budget or mark to aim for, and list these in the column representing present capacity; then in collaboration with the departmental head, step the variable expenses up and down with the rates of operations, as determined upon. Some labor accounts will vary directly with volume of production, while others will only change with possibly every 20 or 30 per cent variation in capacity.

Every item of expense must be considered separately, and this review alone frequently discloses some interesting possibilities for reductions. Having established the allowable amount of each class of expense for each rate of operating capacity, the columns are totaled to show the allowable departmental expense for every capacity, and a copy of the sheet furnished to the interested departmental head. This serves as advance information of the limit of expense which may be incurred for any rate at which production is proceeding. The routine of comparing actual expenses with the budgeted allowances, and taking steps to enforce adherence, is the same as for fixed budgets; and is so well known that it will not be discussed here.

Means Equitable Burden for Each Department

It is surprising that so few organizations have adopted this feature of control because it can be made so sensitive to variations in production as to provide for immediate reduction of specified expenses when sales volume declines. This means that there is no lag in reduction while waiting for business to improve; that there will not be the usual indecision about having to reduce but not knowing where or how; and assures that each department will bear its share of the burden, regardless of the eloquence of the foreman or departmental head in explaining why reductions are possible elsewhere but not in his own division. A supervisor may be perfectly honest in his conviction that he can make no reductions, due largely to the fact that the management has not provided him with the necessary information regarding his operations.

The second condition mentioned above is that of adjustment to meet revisions which have to be made in

the Depression

By F. KLEIN

the selling price of the product. As practically all such price revisions during the past two years have been downward, business has been faced with the necessity of immediately reducing its costs a corresponding amount or having its profits affected adversely to the extent of its failures to so reduce costs. During a period of falling prices, it will usually be found that costs of raw materials and supplies can be reduced in at least the same proportion as the reduction in selling price of the finished product, through effective purchasing. Supervision, clerical and labor costs must be reduced through salary and wage reductions and eliminations. When the two elements of material and labor have been reduced, that of maintenance is automatically decreased, as this usually consists of a combination of the first two items.

Adjustments to Meet Revisions of Prices

But such fixed expenses as depreciation, insurance and taxes cannot be proportionately reduced, and it is here that the ingenuity of the departmental head must be exercised. If average selling prices have been reduced 15 per cent he is asked to reduce the total line of his budget allowances a similar percentage. If the salary and wage reductions (made effective by the general management throughout the plant) and the fall in material and supply costs is insufficient to yield the required reduction, other steps must be taken by the departmental supervisor. This may mean the doubling up of certain duties to permit elimination of one or more workers, placing others on short time, or the abandonment of certain routines not considered worth their cost under the pressure of circumstances. It is really surprising to note the results that are obtained when a supervisor has a definite objective for cost reduction, and when the combined skill and ingenuity of every responsible head is brought to bear on the problem.

Results of Plan

The implication of the foregoing is that a plan or forecast can and should be made for the entire period, but should provide for the usual or expected fluctuations, and be subject to adjustment for unusual conditions as they occur. The thought required to initiate the plan, and effect its realization, makes every employee economy-minded and conscious of the results of his efforts. Now, as since the beginning of time, accomplishment requires an aim or purpose, a planned means of its attainment, and the initiative and skill to secure its consummation.

WORKS INDIRECT EXPENSES
NORMALS FOR VARYING OPERATING CAPACITIES

_____ WORKS

_____ WEEKS _____ DEPT.

		DIRECT HOURS												
	NO.	PER CENT CAPACITY												
	01	Executive Staff												
	02	Foremen												
	03	Inspectors												
	04	Clerical												
		Total Superv. & Cler.												
	10	Guards and Gatemen												
	11	Oilers, Sweep. and Clean.												
	12	Internal Transportation												
○	13	Overtime Bonus												
	14	Idle or Lost Time												
	15	Other Indirect Labor												
		Total Indirect Labor												
	20	Fuel												
○	21	Sand												
	22	Nails, Rods and Wires												
	23	Binders and Facings												
	24	Grinding & Polishing Wheels												
	25	Paints, Lubricants & Waste												
	26	Stationery & Office Supplies												
	27	Miscellaneous Supplies												
	28	Purchased Electricity												
		Total Operating Supplies												
	40	Real Estate												
	41	Buildings												
	42	Machinery												
	43	Motors												
	44	Semi-durable Tools & Inst.												
	45	Internal Transp. Equip't.												
	46	Carting Equipment												
	47	Furniture and Office Appl.												
○	48	Flask Equipment												
	49	Patterns												
	50	Miscellaneous Equipment												
		Total Maintenance												
	60	Re-arrangement of Equip't.												
○	61	Postage												
	62	Telephone												
	63	Telegraph and Cable												
	64	Inventory Adjustment												
	65	Employees' Welfare												
	66	Liability Insurance												
	67	Dues and Subscriptions												
	68	Gratuities												
	69	Rentals												
	70	Experimenting												
	71	Miscellaneous Expense												
		Total Sundries												
		Total Above Charges												
	80	Depreciation												
	81	Insurance												
	82	Taxes												
		Total Fixed Charges												
		Total all Charges												

○ N this form the expenses necessary to produce quantity of units specified for each operating capacity may be listed.

Ship Construction Fell 65 Per Cent in 1932

STEEL seagoing vessels under construction in private shipyards in the United States on Dec. 31 aggregated only 101,552 tons, compared with 286,000 tons on Dec. 31, 1931, according to a report of the National Council of American Shipbuilders. No merchant vessels were contracted for in the past year, while only one Government-owned ship was ordered. Employment in Seaboard shipyards on Jan. 1 of this year numbered 10,000, or practically 40 per cent less than that on Jan. 1, 1932.

A total tonnage of 2,105,088 tons was scrapped throughout the world last year, of which more than 44 per cent represented United States vessels. The brightest prospect for replacement tonnage, the report declares, is offered by the fact that a large percentage of American seagoing tonnage is well over 20 years old.

Shipbuilding abroad suffered a similar setback last year, as revealed by Lloyd's latest report, which showed the total amount of foreign tonnage under construction on Sept. 30 at only 901,067 tons, in contrast with 1,531,120 tons on the same date for 1931.

Selecting and Applying Lubricants for Gears

BY JAMES I. CLOWER
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THE method of applying lubricants to gears varies according to the arrangement of the gears. For completely inclosed gears either circulation oiling or splash oiling is employed. Open or guarded gears may be equipped with a slush pan or hand oiled. Under certain conditions it is advisable to employ grease for open or semi-inclosed gears.

In either circulation or splash oiling, the oil is used continuously over a long period of time. The greater the capacity of the system, the longer is the cycle of circulation and the easier it is to maintain the oil in good condition. Furthermore, a large system provides a greater heat radiating capacity, thereby keeping the oil at a moderate temperature. And since oil oxidation is materially accelerated by heat, it is important to keep the operating temperature as low as possible. For cooling purposes, it is sometimes advisable to spray a copious amount of oil to the outgoing side of the gear teeth mesh.

Oil to be suitable for use in a circulation system must not only be of the correct body to form an effective film over all contacting tooth surfaces, but also be capable of separating readily from impurities which may gain access to the system. It must resist oxidation which may lead to the formation of sludge, and it must act as a coolant by absorbing the frictional heat generated by the rapid engagement of the teeth.

The operating temperatures encountered in circulation systems are generally moderate, hence oils of relatively light body may be used. Heavy-bodied oils should be avoided, as their use may lead to high operating temperatures created by excessive fluid friction within the oil itself.

In splash oiling, it is important to maintain the correct oil level at all times. Care in this respect will aid in obtaining better and longer service from the oil, and strict observance should be given the manufacturers' instructions on this point.

Too high an oil level will cause overheating, due to excessive churning of the oil. Too low an oil level results in insufficient oil being splashed to the parts requiring lubrication, thereby causing inadequate cooling, metallic contact and undue wear.

In splash oiling, the separation of impurities from the oil is hindered by the constant churning which occurs while the gears are in operation. Oil-baths should be drained at regular intervals and all parts thoroughly cleaned before refilling with clean fresh oil. The oil so drained may be reused, provided it is well filtered.

With slush-pan lubrication it is good practice to provide guards to catch any lubricant that may be thrown off of the gears by centrifugal force. These guards should be so arranged that any oil caught will be returned to the slush pan.

Obviously in this system of lubrication the lubricant is exposed to the contaminating effects of dust, dirt and any other impurities that may be in the surrounding atmosphere. The lubricant, therefore, should be replaced at regular intervals, the frequency of which depends upon the cleanliness of the surrounding atmosphere.

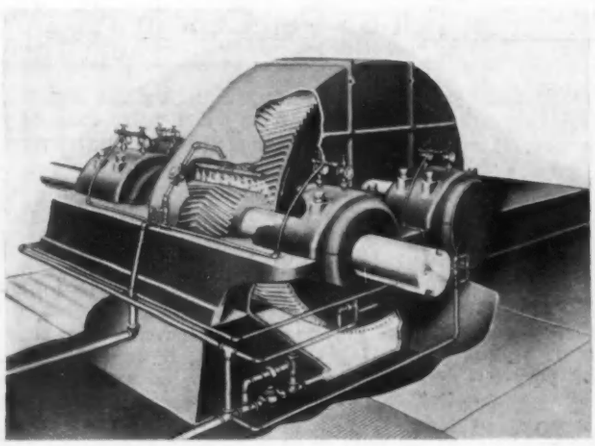
For slush-pan lubrication, a heavy-bodied, tacky, adhesive petroleum product should be used. It should not be so heavy, however, as to channel in the pan.

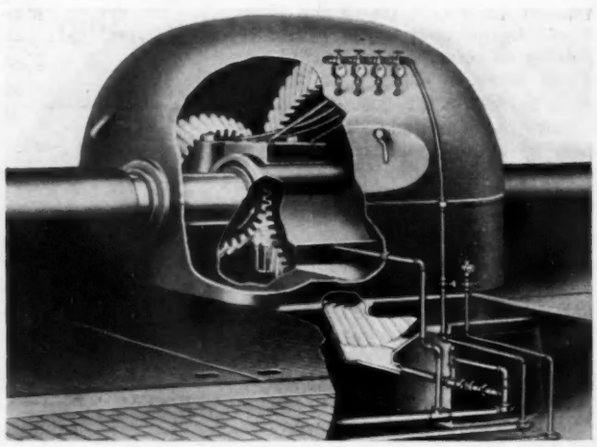
Hand oiling is generally confined to slow-speed, open gears with cast teeth and certain small, light-loaded gears.

For hand oiled, rough cast gears a lubricant of similar characteristics to that used in slush pans should be employed. It is advisable to apply this type of product in a heated condition, as a more even coating can be obtained. To secure best results, the teeth should be cleaned thoroughly.

For hand oiled, light loaded gears the lubricant should possess the property of adhesiveness to an unusual degree so that it will protect the teeth between consecutive applications.

On open or semi-inclosed gears exposed to considerable quantities of dirt, it is usually advantageous to employ grease for their lubrication. A straight petroleum product, such as





BOWSER'S perforated-pipe lubricator for herringbone gears. Note how the oil is sprayed into the incoming side of the teeth (At Left)

Bowser's flattened-steel-pipe sprays injecting oil into the mesh of large bevel gears (At Right)

that just mentioned, may mix with the impurities, cake and flake off. The grease is best applied by paddle; whether it should be heated before application depends upon its consistency. As in the case of oil, the teeth should be as clean and dry as possible before applying the grease. Care should be taken to apply the grease as uniformly as possible.

The grease employed should be of the correct consistency and character to form an effective film over all contacting tooth surfaces. It should not contain any filling or loading materials of a solid nature; it should be neutral, that is, contain no free fatty acid or alkali.

Guides to Selection of Gear Lubricants

Due to the wide variations in design, construction, housing, operating conditions and methods of lubrication, it is necessary to consider a fairly wide range of lubricants. The requirements in a given plant, however, can be cared for usually by two or three lubricants and sometimes one.

The accompanying "Guide to Selection of Correct Gear Lubricants" is not infallible. It is obviously impossible to draw up a chart of this kind that will cover the entire field of gear lubrication. The lubricants listed are intended primarily for independent

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OUTLINING what must be considered in various methods of applying lubricants to gears, the author then tabulates out of an extended experience the lubrication that should be used for each of several classes of duty. In The Iron Age of Dec. 15, 1932, in introduction to this article, he explained the phenomena of gear lubrication.

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gear sets, and for gears of machines in which the selection of a suitable lubricant depends wholly upon the gear requirements.

Where the gears and other lubricated parts are lubricated from a common system and it is necessary to use one oil throughout, a compromise must be made between the gear requirements and those of the other parts. Under such conditions, the Guide will be found useful for purposes of comparison, as it indicates the type of lubricant that will meet best the lubrication requirements of the gears.

The Guide is based on wide experience in gear lubrication, and the specifications given are of lubricants which have proved in actual service their fitness for the service for which they are recommended.

Machinery Trade Looks for Gains This Year

Washington, Jan. 10. — Machinery and equipment associations look for improved business in 1933. Report to this effect was made by them to Secretary of Commerce Roy D. Chapin. They formed a portion of 44 reports submitted by trade associations representing a cross-section of industry, at the request of Secretary Chapin.

The Secretary, in a summary of the reports, said the replies indicate that there has been a greater tendency than before for each industry to place its house in order and to stand ready to capitalize any improvement in demand that may be forthcoming 1933. The replies also create the impression, he said, that there is a rather widespread feeling that the country is grappling with its problems at the present time in a realistic manner that should bring results. The expressions did not anticipate pronounced or sudden improvement, but rather a slow upward trend which would result in the second half of the year making a favorable comparison with the past six months.

GUIDE TO SELECTION OF CORRECT GEAR LUBRICANTS
(SPUR, HELICAL, HERRINGBONE AND BEVEL GEARS)

OILS

Duties	Typical Examples	Operating Conditions	Method of Lubrication	Oil Specifications — A.S.T.M. Viscosity — 100 Deg.	130 Deg.	210 Deg.	Pour, Deg. F.	Flash, Deg. F.	Fire, Deg. F.	Per Cent Fixed Oil
Extra light	Very light machine tools	All	Circulation or splash	150	85	42	5	385	440	None
Light	Machine tools, small speed reducers	All	Circulation, splash or oil can	320	143	50	10	390	445	None
Moderate	Large speed reducers, excavating machines, reciprocating pumps	Clean surroundings all temperatures	Circulation or slush pan	660	270	66	25	425	480	None
				...	...	400	70	450	540	None
		Low temp's	Splash	320	143	50	10	390	445	None
		Other temp's		660	270	66	25	425	480	None
Heavy	Presses, punches, shears, stone crushers, rod and merchant mill pinions, rubber mill drives	All temperatures	Circulation	950	390	85	40	450	500	None
			Slush pan	...	...	600	75	450	540	None
		Low temp.	Splash	650	280	75	10	350	385	21
		Other temp's.		1900	750	140	40	540	600	5
Extra heavy	Billet and blooming mill pinions, rail and plate reduction gears	Normal and low temperatures	Circulation	1550	605	118	40	500	565	None
			Splash	3700	1360	210	35	610	680	5
			Slush pan	...	...	900	75	450	540	None
Special Extra heavy	Blooming mill pinions	All	Circulation	2600	850	150	45	540	600	None
			Splash	...	...	900	75	450	540	None

GREASES

Duties	Typical Examples	Operating Conditions	Method of Lubrication	Grease Description
Extra light	Timing gears	Non-metallic gears	Paddle	A medium consistency (No. 3), high-grade graphite grease of lime soap base
Light	Motor Drives	Non-metallic	Paddle	Same as above
		Metal-open		A soft consistency (No. 2), high-grade cup grease of lime soap base
Moderate and heavy	Same examples as given above	Open or Semi-enclosed—Dirty conditions	Paddle	A heavy, dark gear grease of a consistency such that it can be applied cold by paddle

Bearing Notes

(a) Obviously, where the gears and bearings are served by the same splash or circulation oiling system, the oil should be selected for the more severe service, namely, the gears.
(b) Where gears and bearings are served by independent oiling systems, manifestly the bearing oil should be selected without consideration of the gears.
(c) In general, the oil employed on the gears is suitable for the bearings.

Savings From Proper Selection of Burner Equipment

By HENRY M. HEYN
Sales Engineer, Surface Combustion Corpn.

THERE has never been a time in the history of industry when the correct combustion of gas played such an important part as it does today. Never before has so much attention been given to the science of combustion. But regardless of the progress that has been made large losses still exist due to incomplete and inefficient combustion of gases and the improper application of equipment.

The gas furnace has graduated from a pile of brick with a burner consisting of a piece of pipe set in the wall. We now have furnaces and automatic burner mechanism of alloy, firebrick and insulation built within a steel casing, so designed and controlled as to give uniformity of temperature and atmosphere. This permits the production of work of a quality that a few years ago was impossible.

This has been accomplished largely through the use of automatic proportioning burner equipment which automatically and continuously maintains the correct proportion of air and gas in the mixture, thus securing the close control of the furnace atmosphere, regardless of changes in air or gas pressure.

Some concrete examples will best illustrate the savings possible with automatic proportioning burner equipment.

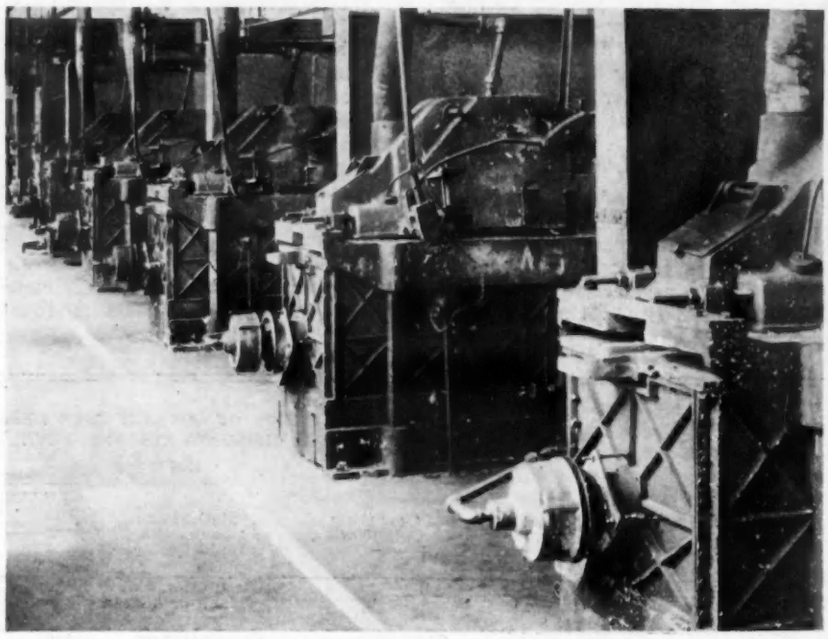
The Herbrand Co., Fremont, Ohio, had a continuous gas-fired hardening furnace, with two-valve control burners. The user was unable to get a uniform temperature and had no control over the atmosphere in his furnace. This resulted in non-uniformity of product and a high percentage of rejects with a correspondingly high fuel consumption per unit of production. This was, of course, very costly and could not be continued.

As the result of investigation and study by our engineers, automatic proportioning, two stage, high pressure burners were installed. The results were reduction in gas consumption per unit of production of 41.5 per cent, and an increase in production of 22.2 per cent.

The reduction in gas consumption was a result of the proper selection of burner equipment for the particular job and the right application of this equipment to the existing furnace.

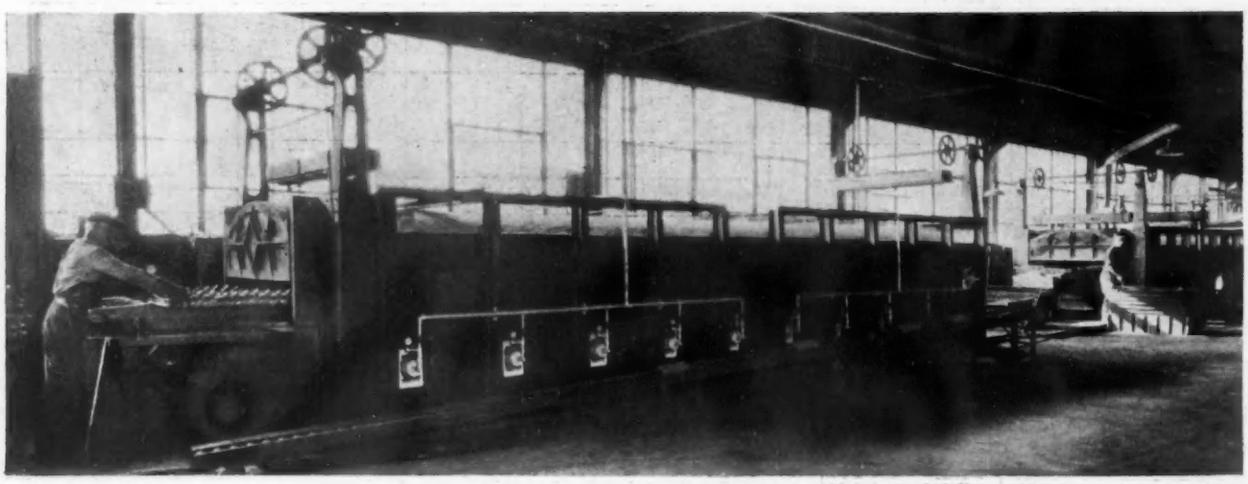
The increase of production was due to two things: 1. A much faster and better heating due to the correct heat application; 2. Considerable time was

(*Concluded on Advertising Page* 12)



(Above). An increase of production per machine hour of from 15 to 18 per cent was obtained by the Doehler Die Casting Co., which recently converted all of its die casting department to gas fuel and installed automatic control equipment.

(Below). Gas consumption per unit of production was reduced 41.5 per cent and production increased 22.2 per cent in this continuous gas fired furnace through the installation of correct burner equipment.



Automatic Gear Finishing Machine Operates Rapidly

GEAR teeth processed on the Red Ring gear finishing machine being marketed by the National Broach & Machine Co., Detroit, are said to be corrected in profile to within 0.0001+ in. of a true involute curve. Index, eccentricity and helical angle are also corrected, and each tooth surface is made smooth and bright.

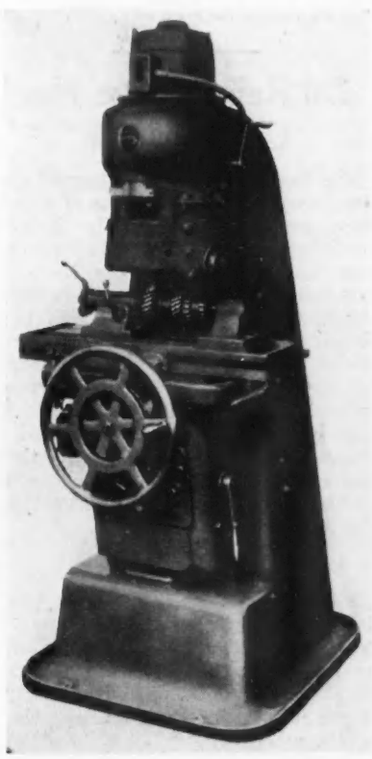
This machine cuts at an angle with the axis of the gear and generates the shape of each tooth in the same direction as that taken by the teeth of two mating gears sliding over one another. Elimination of the "washboard" effect on the gear teeth is held to be one of the most important factors in eliminating gear noise and squeal.

Operation is entirely automatic and the machine may be set to take off any predetermined amount of stock. One operator can attend a battery of the machines. Rapid production is a feature; a 20-tooth gear having 9.25 pitch, 20-deg. pressure angle and 35-deg. helix angle being processed, it is stated, in 20 to 40 sec. floor-to-floor time.

The underlying principle of the machine is the controlled action at high speeds of a special alloy-steel cutting tool in the form of a helical gear. This tool, mating with and guiding the gear being processed, removes stock in the form of very fine shavings. The tool is gashed or slotted at one or more points along its face and the actual cutting is done by the acute cutting edges at each side of the slot. The cutting action is accompanied by traversing the work gear axially while in contact with the cutting gear. Cutting edges are said to handle between 300 to 500 work units before grinding is necessary. The sharpening operation is merely that of face grinding the sides of the slot to a depth of 0.005+ in. Each slot is capable of about 10 such grindings.

The cutter-head of the machine is adjustable about its vertical axis to bring the cutter arbor into the desired angular relation with the work arbor mounted on the table beneath. The table has a longitudinal reciprocating movement and a vertical feed—both automatic. The cutter arbor is driven by a motor in the head and the table motions are actuated by a separate motor in the base.

Table travel is set an amount equal to or a little greater than the face width of the gear being finished. As the table arrives at each end of its travel, it reverses direction automatically; simultaneously, the direction of rotation of the cutter is reversed. In this way, both faces of each tooth are subjected to the action of the cutter during every table cycle. Upon the completion of each table cycle the table is automatically fed upward, and at the end of any predetermined number of cycles the machine stops automatically.



(At left). Gear finishing machine designed to correct profile, tooth spacing, eccentricity and helical angle. The tooth surface is left smooth and bright.

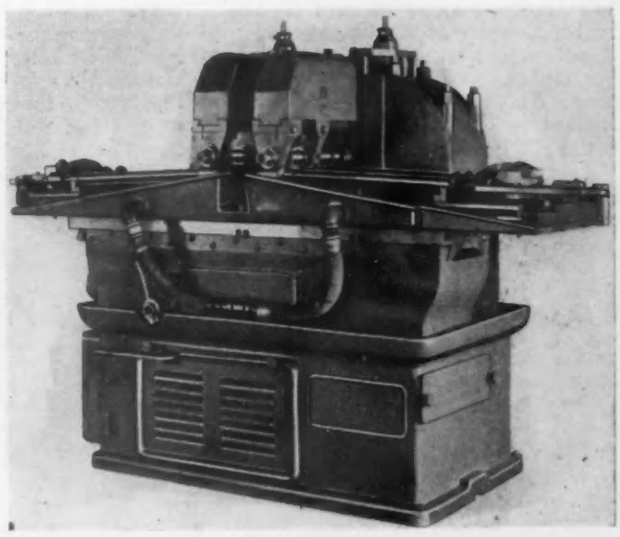
Production Miller Has Automatic Table and Head Feeds

AUTOMATIC horizontal travel of the table and automatic vertical travel of the cutter heads are combined in the new No. 120 Producto-Matic milling machine recently introduced by the Producto Machine Co., Bridgeport, Conn. With this arrangement various combinations of milling cuts can be obtained.

Although usually furnished with two columns and two cutter heads as shown, the machine can be built with three or even four columns and heads. With the two column arrangement two sets of parts can be placed on the table, one set at each end and alternately milled, the operator loading and unloading one group of parts while that on the opposite end is being machined. Generally the heads travel vertically to bring the cutters to the exact depth of cut, at which they remain while the table travels horizontally to finish the main portion of the cut. However, the cutters can be arranged to leave the work at any desired point and return again if necessary. With the combined movement of cutters and table, it is possible to take cuts at any desired angle and also at various radii.

The machine has been used effectively for milling keyways in automobile rear axle or propeller shafts and in electric motor armature shafts. On such work the keyways are "blind," that is, they do not run out at the end of the shaft. It is stated that in many classes of milling the amount of stroke or travel can be lessened, production can be speeded up and the finish can be improved if the cutters can first mill to a depth before the table travels horizontally.

Equipped with two columns and two cutter heads, the machine weighs about 9000 lb., exclusive of fixtures. The cabinet base, which is 72 in. long



(At right). Production miller arranged for milling keyways in automobile rear axle shafts. With the two column arrangement, the operator can reload parts at one end of the table while those on the opposite end are being milled.

and 44 in. wide, contains the 10-hp. driving motor, mounted in a section in the center, and also the gear case or transmission. The latter, inserted into the rear end of the base, is a separate unit; it is in two sections, one of which contains the feed and speed pick-off gears. All shafts in the transmission unit are mounted on Timken roller bearings. The base also houses a large coolant tank reservoir and a chip chamber.

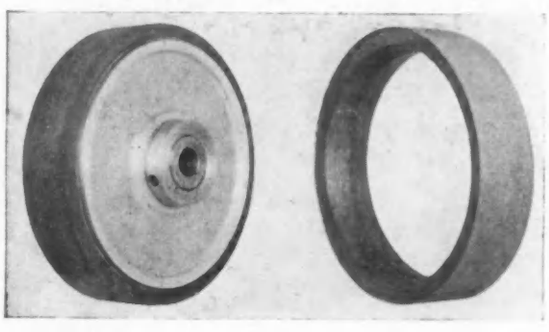
Automatic operation of the table, which is 76 in. long and 18 in. wide, is governed by a cam drum mounted in the bed directly under the table. Control of the movements of the cutter head is by means of another cam shaft, equipped with two box-type cams. The table feed mechanism provides movement of 8 in. for the work on each end of the table, and the head feeding mechanism is designed to give vertical travel of 4 in. for the cutters.

Cutter spindles are of alloy steel, heat-treated and ground all over, and rotate in two bronze bearings. They have the standard taper on the driving end, and the nose is slotted also for driving. Spindles are hollow to provide for a draw bar. Each cutter spindle is driven by a heat-treated and ground alloy steel worm and bronze worm gear contained within the spindle bearing housing. The worm drive shaft rotates on ball bearings and the cutter spindle drive shaft on Timken roller bearings. Ball thrust bearings are provided back of each miter gear that drives the vertical shafts employed in the drive from the main gear box to the spindle driving worm.

Belts of New Polishing Wheel Changed Rapidly

A POLISHING wheel having an expanding aluminum wheel and demountable endless abrasive belt has been brought out by the Jiffy Polishing Wheel Co., 327 Frankfort Avenue, Cleveland. The wheel consists of two flanges with beveled peripheries and a rubber cushion with the same degree of taper on the inner side as on the face of the wheel. The inner flange is permanently fastened to the end of the shaft of the polishing machine, the rubber cushion is mounted on this flange and the belt is slipped over the cushion. The outer flange is mounted on a bushing on the permanent flange. The wheel is assembled by drawing the two parts together with an adjustable collar after the cushion and belt are in place. This causes the expansion of the cushion and the tightening of the abrasive belt.

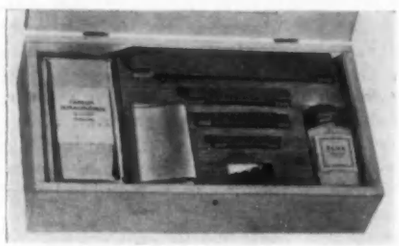
Abrasive belts of any grit can be used, and it is stated that when a change in grit is required the belt can be changed in less than a minute. The cushion may be of hard or soft rubber as required for different types of polishing work. An Aloxite cloth belt made by the Carborundum Co. is used. The belt has a perfectly flat surface, which it is stated can be used entirely. The wheel is made in 8, 10 and 12 in. diameters with 2½ and 3 in. faces, a wheel 14 in. in diameter by 4 in face will be brought out later.



ABRASIVE belts of any grit can be used on this expanding polishing wheel, and the belts can be changed in less than a minute. The wheel is made of aluminum.

Carboloy Tool Kit For Job Shops

TO enable job and other shops having highly diversified, short-run production, to use Carboloy cemented-carbide tools more extensively, the

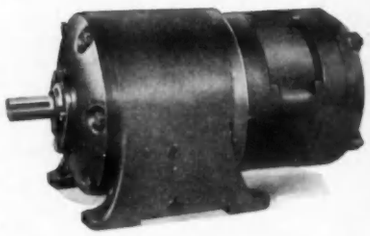


Carboloy Co., Detroit, has developed the tool manufacturing kit illustrated.

The standard kit contains brazing and cleaning materials and an assortment of Carboloy tips and shanks for making four tools size ⅜ in. sq. x 2½ in.; ½ in. sq. x 3½ in.; ⅝ in. sq. x 4 in.; and ⅝ in. x 1¼ in. x 8 in. Shanks are recessed to fit the tips for either right- or left-hand use. The shank and tip sizes, styles and quantities may be varied to meet special requirements. Reduced investment cost and flexibility of use are advantages of this kit. Through development of a method for safely removing the tips from the shank, the user may change the tool style and size whenever desired.

Motor Reduction Unit for Low Speed Drives

THE Allis-Chalmers Mfg. Co., Milwaukee, announces the development of a motor reduction unit for use where low-speed drives are required. A standard round frame type motor is mounted directly on the gear reducer housing, thus forming a compact unit. Helical gears are used



to permit the highest possible efficiency and the most quiet operation.

Standard speeds at the power take-off are from 3.02 r.p.m. to 380 r.p.m., but lower speeds can be provided. A speed of 6.08 r.p.m. is obtained with the use of a 1750 r.p.m. motor.

The bearings supporting the gear drives are ball or roller type. Lubrication is automatic and continuous. Units can be supplied for wall, ceiling or vertical mounting. Any desired type of motor may be supplied.

Oil Relief Valve Has Compensator

For fuel oil and lubricating oil systems where the maintenance of a constant pressure is especially desired, the Schutte & Koerting Co., Philadelphia, has incorporated into its pressure-relief and back-pressure valves a compensating mechanism which is a simple set of three links or levers placed between the valve plug and the spring. The spring is not compressed the same distance that the plug moves but instead is moved a progressively smaller distance than the plug, all with the idea of securing a closer regulation of pressure than would otherwise be the case.

Electric Hoist Manufacturers Association reports that the number of hoist ordred during December decreased 41 per cent, as compared with the previous month. Shipments were 24 per cent smaller in December than in November.

Captains of Industry Need to Supply Collective Leadership

By DR. LIONEL D. EDIE

SAVE for a few exceptions, industrial leaders have been so concerned about their individual ships that they have given inadequate thought to the fleet. The depression has now reached a stage where industrialists might facilitate the process of recovery by going beyond this previous mental horizon. The *financial crisis* apparently reached a maximum intensity in June of 1932; the year 1933, however, continues to possess the characteristics of a stubborn *industrial crisis*.

In the course of time, the industrial crisis doubtless would solve itself, but in the present case time may not wait. If the industrial crisis were to continue through 1933, would currency inflation be preventable? Could the country carry the unemployment load? Time is important. To trust to luck, chance and nature is unwise. No industrialist would do it in his own plant, and industrialists collectively cannot afford to do it in the national plant.

Past Attitude Toward Industrial Phase of Depression

What light does recent history throw upon the mental attitude of industrialists toward such a responsibility? A few elements may be passed in brief review.

(a) Industrialists have gone a surprisingly long way in the direction of leaning on the Government. The philosophy back of the Reconstruction Finance Corporation is an indication of this tendency. The new Kent plan to have the Government guarantee business against losses is a further indication. Will industrialists drift further in this direction or will they work out by self-help applied by voluntary group action of industry itself?

(b) Industrialists have apparently been very critical of Congress, but some of the short-comings of Congress can scarcely be disassociated from the attitudes of business men themselves. The present trade barriers of the world were given great impetus by our own tariff legislation of 1930 and 1932, but did not this legislation represent at the time the will of the industrialists concerned? If industrialists were to put as much pressure on Congress to secure a balanced budget as they formerly put to secure specific tariff rates, is there any doubt about the budget's problem being met promptly?

(c) Agriculture has fallen grievously out of balance with industry. This disturbance has been allowed to drift to the point where farm leaders have drafted a bill which suffers from the fact that it has been drawn by those whose self-interest is chiefly concerned. The problem should have been taken seriously by industrial and other broad groups of leadership to insure a solution in harmony with the needs of all interests, but initiative has been lacking in these quarters, with the result that initiative has had to be taken by agriculture itself. At the present stage, merely to rail against the Allotment Bill is a woefully inadequate substitute for a positive approach to the problem by non-farm leadership in cooperation with farm leadership.

(d) Industrial leadership has, with rare exceptions, held a negative attitude toward monetary policy. Inflation and deflation may be traced to many causes, but the regulatory force of monetary policy was not invoked to arrest these convulsions until too late. In general, the industrial crowd have acted as if they thought monetary policy about the least important thing in the world, and this indifference has cost them dearly. Now there is a rising tide of inflationary sentiment in industrial circles as the easy way out. What kind of monetary policy do industrialists want?

(e) Unemployment is, perhaps, the vital, human phase of the industrial crisis. Relief has been carried on in many forms, "share-the-work" has helped appreciably, but these do not correct the major unemployment burden. Grasping at a superficially plausible straw, many spokesmen have demanded, in face of unemployment, further restriction of production. This formula of escape is not the formula of thoughtful industrial statesmanship. Less production certainly means more unemployment. Is this the best answer of industrial leadership to our unparalleled unemployment burden?

The Crux of an Industrial Crisis

Only one conclusion can be made, namely, that the industrialists have not even begun to give the industrial crisis the careful thought which it deserves. It cannot be left to Congress. It cannot be left to individuals preoccupied with keeping their own raft afloat. It cannot be left to a cult which preaches that the very technology of the industrialists will itself smash the whole price system, and, if matters are allowed to drift, will lead to revolution. It cannot be left to chance.

If serious thought is to be given to the industrial crisis, the crux of the problem must be recognized at the outset. *The crux of the problem is how to effect an increase in the exchange of goods.*

The Organization of Industrial Thought

Chambers of Commerce have drafted repeated resolutions applying to the crisis, but these mainly follow the conventional lines of thought. Trade associations have held countless conferences on the questions of the depression, but they do not appear to have struck through the veneer.

Public discussion teems with hundreds of individual suggestions, panaceas and nostrums. Even if these contain valuable ideas, there is no systematic attempt to sift the wheat from the chaff and little chance of any such ideas, however meritorious, being incorporated in a tangible program commanding responsible support.

There is an industrial problem to be solved, and an organization of competent thought is necessary. Let us suppose that a small group of 25, more or less, of outstanding industrial executives were unostentatiously to come together for the resolved purpose of focusing the best intelligence available upon the situation. A smaller group might be designated to take the brunt of the load. A few would find it necessary to cast their ordinary business routines entirely aside, just as certain dollar-a-year executives did to serve the Government during the War.

They might shut themselves in, so to speak, and do nothing but work on the industrial problem. They would take counsel of experts—economists, engineers, political authorities, bankers, agriculturists, labor leaders. *Their objective would be to formulate a program of action to break through the stone wall of the industrial crisis and to re-establish the interchange of goods.* Such a program would be one which industrialists everywhere could get behind.

Perspective

This point of view is suggested, not by any new sense of pessimism about the outlook, but by the rising obviousness of the need to recognize the time factor.

Many will say it is not necessary.

One school will say that if only political officials in Washington will balance the budget, business will pick up automatically. Another will say that easy money will inevitably turn the situation into an upward spiral. Another will say that if war debts are settled, prosperity will leap back. Another will say that if nature is left to take its course, business recovery will take care of itself as it always has in the past. Another will say that if only debt readjustments are completed in realistic fashion, business will be liberated. "If only" this or that is done, so the argument will run, we need not worry about the industrial crisis.

There is much reason to hope so, but time is involved. To take the chance on "waiting for something to turn up" is a doctrine of carelessness or of blind faith.

It is true that many obstacles to recovery have been removed and more are being removed every day. A constructive monetary policy is in effect and is exerting its effects in many channels unobserved by the public. The bond market has shown important improvement in many divisions. Certain foreign countries have already shown internal industrial improvement. The commodity price level is being held at an approximate horizontal line. Debt readjustments are being made every day. There are many phases of progress, many constructive forces working, many encouraging developments.

Nevertheless, the writer feels it has become desirable to aid all these factors by a more direct attack on the purely industrial crisis. This attack ought to come from within industry itself.

Decision Defines License Rights of United Under Steckel Patent

THE recent decision of the United States District Court at Pittsburgh, holding valid Steckel Patent No. 1,779,195, owned by the Cold Metal Process Co., Youngstown, covering the four-high roller bearing mill, and also sustaining the right of the United Engineering & Foundry Co., Pittsburgh, to manufacture such mills under a license from the Cold Metal company, which was referred to briefly in THE IRON AGE, Jan. 12, page 119, is of major importance to the flat rolled steel industry. In the suit, which was filed in March, 1931, the Cold Metal Process Co. had contended that the United Engineering & Foundry Co. had infringed upon the Steckel patent covering the four-high roller bearing mill, and that a contract between the two companies for manufacture of the same by United had been breached by the defendant.

The United company contended that the patent involved is invalid, and that under the contract previously entered into between the two parties, United is entitled to a license if the patent is valid. The court held that the patent in the suit is valid; that the defendant, by reason of the license, has not infringed the patent in suit; that the contract of June 27, 1927, between the defendant and the plaintiff is a valid existing contract, and that the bill should be dismissed at the cost of the plaintiff.

The four-high roller bearing mill was commercially introduced for sale by the United company about 1925. The main feature of the controversy was the use of roller bearings on the necks of the back rollers, by means of which, according to the patent sued on, heating of the roll necks which would cause wrinkling or buckling of steel being rolled at high speed is avoided. Before the bringing of the suit the parties concerned had been involved in a Patent Office interference in the course of which they entered into a contract, under which the United company was to receive a license when and if a Steckel patent issued containing certain claims. The original Steckel patent application was filed on June 30, 1923, and on Oct. 21, 1930, the claims referred to were allowed on Patent No. 1,779,195.

The contract between the two companies, as entered into the testimony of the case, stated that, "Cold Metal Process Co. shall grant to United Engineering & Foundry Co. a license to make, use and sell rolling mills under such claim or claims, which license shall be exclusive to United for four-high hot mills and for four-high cold mills in which the major portion of the power required by a roll stand is supplied to the rolls directly and not through tension exerted on the material for pulling it through the rolls." The apparent effect, therefore, will be that the United company is the only concern that has a right to make, use or sell the four-high mills covered by the Steckel patent within the exclusive field described above. It would thus be indicated that not even the Cold Metal company itself can make, use or sell the patented mills in that field except with the consent of United. In the contract, however, the Cold Metal company "reserved the right to make or have made for its own use, and to use in its own plant or plants such hot and cold mills." The contract also stated that the Cold Metal company "shall have the right to make, use and sell, or to license others to make, use or sell such four-high mills in combination with means for coiling the rolled strip between passes as described in the pending application of A. P. Steckel, serial No. 198,915, filed June 15, 1927." This refers to the Steckel hot mill.

The contract also provided that the parties concerned should negotiate payment to be made by United to the Cold Metal company for license to manufacture under the patent, and that if the parties cannot agree upon such payment the matter shall be submitted to three arbitrators, whose majority decision shall be accepted as final by both parties. No action has yet been taken by the arbitrators.

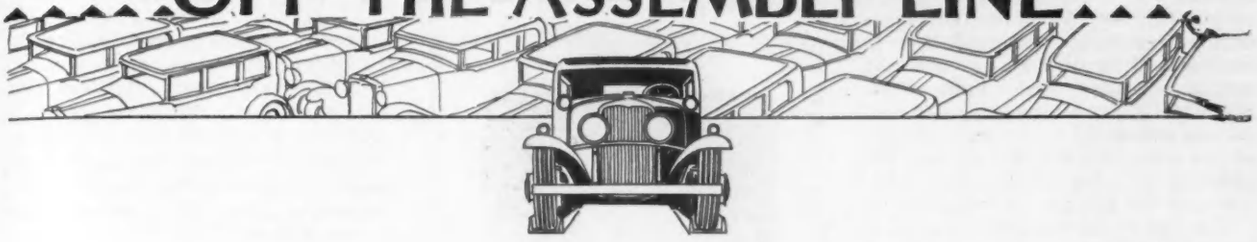
Cleveland and Buffalo Steel Mills Ask for Lower Rates to Detroit

THE petition of the United States Steel Corpn. subsidiaries for lower freight rates from Pittsburgh, Youngstown and Cleveland to Detroit and Toledo, which also has the support of independent steel companies in those districts, was given further hearing before representatives of the Central Freight Association, Trunk Line Association and New England Freight Association in Pittsburgh on Jan. 13. The petition asks for reductions ranging from 4c. to 15½c. per 100 lb., as mentioned in THE IRON AGE of Jan. 12, page 116. However, a rate of 18½c. per 100 lb. from Pittsburgh to Detroit is now asked as compared with a 20c. rate in the original suggestion.

In presenting the petition, John A. Coakley, general traffic manager for the Steel Corporation, pointed out that 750,000 tons of steel was moved to Detroit last year by water, and that inland companies could no longer afford to pay the high rate required by the railroads if they were to continue to meet this competition. Mr. Coakley even suggested that the Steel Corporation is prepared to relocate its plants at points nearer the Detroit consuming area unless some relief from present high rates is granted.

The Bethlehem Steel Corpn. asked for a comparable reduction in the freight rate from Johnstown, Pa., to Detroit, while the Wickwire-Spencer Steel Co. proposed a comparable reduction in the Buffalo-Detroit rate on finished steel products. Both the Corrigan, McKinney Steel Co. and the Otis Steel Co. proposed a reduced rate from Cleveland to Detroit, while the former favored a lower rate on finished steel from Monroe to Detroit, and on sheet bars from Cleveland to Monroe. Steel companies in the Pittsburgh and Valley districts unanimously approved the proposed reductions, and were joined by the Great Lakes Steel Corpn., Detroit, a subsidiary of the National Steel Corpn.

OFF THE ASSEMBLY LINE



February Motor Car Output Uncertain As Factories Await Sales Returns

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DETROIT, Jan. 16.

DESPITE the fact that the course which automobile production will take next month is hazy at the moment, current operations are being maintained at or near recent levels and steel releases have taken another upward swing. In fact, orders received from the motor car industry by one of the larger steel companies in the first 10 days of January were the best since January, 1932. Contributing to the increased steel releases of the past week was a considerable purchase by the Chevrolet Motor Co. mainly for the purpose of evening up stocks. In some items the orders covered only 15,000 cars, but in others as high as 40,000 cars.

It is reported that Chevrolet's assemblies this month will be about 47,000 cars instead of the earlier anticipated 55,000. However, it is no secret that Chevrolet officials are much encouraged at the volume of retail sales. Chrysler's various plants have gone from a five-day week basis to four days a week. January output of the Chrysler Corpn. is expected to be nearer 20,000 units than 25,000. Pontiac is making about 9000 cars this month and Oldsmobile 6000. Buick's schedule calls for 4000 cars. The Wilson foundry at Pontiac, Mich., is making motors for Willys-Overland at a fair rate. This means that the industry's production this month should be higher than that in December, which is estimated at 102,770 units by the National Automobile Chamber of Commerce, a figure considerably lower than first reports had indicated.

February Plans in Abeyance

It is impossible at this time to tell what February output will be, except that unless a pick-up in sales occurs there will be a general scaling down of operations compared with the current rate. Assemblies are being decided upon from week to week, being entirely dependent upon retail orders. Most factories are holding next month's plans in abeyance until near the end of January when they can better gage the retail outlook as determined by the various automobile shows. Chevrolet has tentatively scheduled 40,000 to 45,000 cars for next month, but this, of course, is subject to whatever revision is deemed advisable after further sales returns are known. Incidentally, the fact that the industry is likely to slow down assemblies temporarily after stocking dealers should not be cause for alarm, as it is a practice which regularly occurs.

Chevrolet is making 47,000 cars this month, with a tentative schedule of 40,000 to 45,000 cars in February.

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New passenger car sales in 1932 estimated at 1,097,716 units, compared with 1,908,141 in 1931, according to R. L. Polk & Co. Truck sales were 181,291 as against 313,884 the previous year.

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February production schedules are being held in abeyance until facories receive further sales returns.

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It is the consensus of opinion in automotive circles that cars selling at $1000 to $2000 will suffer the most during 1933. That is, an increasing proportion of the total business will be in cars priced at $350 to $850, many buyers ordinarily in the higher brackets being forced to purchase a cheaper car due to curtailed income. On the other hand, quality cars will still have a certain dependable market. Owners in this class have been hit, too, by the depression, but a substantial percentage of them still are able to buy a Cadillac or Packard or Lincoln. Witness the success with which Cadillac is meeting in its effort to sell 400 V-sixteens this year and the apparent ease with which Pierce-Arrow disposed of the five ultra-stream-lined Silver Arrow models which it will build at $10,000 each. Thus the makers in the medium-price group will be uncomfortably squeezed between the two. That this effect is already being felt is illustrated by the action of one company in the $1000-$2000 class which has cut down its 1933 sales and production quota from 55,000 to 35,000 cars.

Sweeping Mechanical Changes Likely on 1934 Cars

Althought the machine tool trade can look with slight hope toward the automobile industry for business in the first half of this year, the last six months are virtually certain to tell a different story. The reason for this is that automobile companies have drifted along about as far as they can without instituting some radical mechanical changes. Realizing that their market would be severely restricted, they have with a few notable exceptions avoided for at least two years major expenditures for equipment occasioned by tooling up for the manufacture of newly-designed mechanical parts. In 1933 models mechanical changes are insignificant. In fact, motor car salesmen no longer have a fresh story to relate to prospects. Gadgets have already run their course, and people will not be satisfied with minor changes in the contour of the fender or the radiator or the body. Therefore, a number of mechanical innovations are due in 1934. The first really automatic transmission is likely to be an outstanding feature. One maker has ready a transmission which eliminates the use of the left foot pedal or hand-operated gear-shift lever. By pushing forward a foot pedal resembling the accelerator the motorist automatically engages the starter, starts the engine and the car moves forward. The farther he pushes the pedal, the more rapidly the car is propelled. When he releases the pedal, the gears are automatically disengaged and the motor idles.

While it is understood that Ford is now making parts for its new cars at the Rouge plant, assemblies are said

to be few in number and parts suppliers have not yet received volume releases. It is now doubtful whether output this month will be of significant proportions. Ford production is expected to expand slowly and not attain a sizable scale until about March 1. Ford operations should contribute materially to the performance of the steel industry this spring, but probably will not assume major importance for another 30 days.

The war in the lowest-price class is getting under way, but will not burst out in all its intensity until Mr. Ford reveals his hand. General Motors has a small car, the so-called Mercury, for which it is already tooled up and has placed parts and which it can bring onto the market on short notice. It is acknowledged that Chrysler will not sit idly by and see its sales slogan, "Look at all three," fade out of the picture, although the nature of its counter-attack is not definitely known. One of the things about which Detroiters are speculating is whether the leaders in the low-price class will be content to let Willys and Continental have a monopoly on four-cylinder cars. It is known, of course, that these two will not go long unchallenged as the only occupants of the $350-$400 bracket.

Detroit Notes

Great Lakes Steel Corpn. now is operating five out of six open-hearth furnaces . . . General Motors sold 510,060 cars and trucks at retail in the United States in 1932, or about 40 per cent of the industry's total. This compares with 42 per cent in 1931, 35 per cent in 1930 and 34 per cent in 1929. It is not realized perhaps that General Motors not only sold 37,201 more cars than it made last year, but also sold more cars than it assembled in 1931 and 1930 . . . Seven manufacturers are displaying cars with the new type of steel artillery wheel built by the Budd Wheel Co. The wheel can be shaped to suit the individual requirements of any automobile body. The back of the wheel may be left open or closed with a welded plate. The entire wheel is made from a single piece of steel, in a spider formation, and embodies a pronounced convex shape which flows into blending lines from the spokes outwardly to the hub cap. The spoke ends are folded over out of the original piece of metal and riveted directly to the rim. The wheel has about the same weight as a wire wheel and is an evolution of the steel two-piece wheel exhibited two years ago by Budd on Pierce-Arrow cars . . . One car yet to be announced is reported to have a crankshaft made of electric furnace iron, but the camshaft will be a forging . . . Nineteen thirty-three cars have more zinc die castings than the models they are replacing.

E. R. CRAWFORD, president of the McKeesport Tin Plate Co., McKeesport, Pa., has been elected a director in the Mellon National Bank, Pittsburgh.

...PERSONALS...

FREDERICK G. HUGHES

FREDERICK G. HUGHES, vice-president of the New Departure Mfg. Co., Bristol, Conn., has been made general manager of the company. He became identified with the company in April, 1911, as production manager, and through a series of promotions became chief engineer, assistant general manager and vice-president. Prior to his connection with that company, Mr. Hughes was experimental engineer at the Bethlehem plant of the Bethlehem Steel Corpn., and chief engineer of the Driggs-Seabury Corpn., Sharon, Pa., He has taken an active interest in association work, having been chairman of the ball bearing standardization committee of the Society of Automotive Engineers, president of the American Society for Steel Treating and a member of the American Society of Mechanical Engineers. He was graduated from Yale University in 1900.

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WILLIAM P. WITHEROW, formerly a vice-president of the Republic Steel Corpn., Youngstown, and president of the Witherow Steel Corpn., Pittsburgh, prior to its absorption by Republic, has been elected a director of the Keystone Driller Co., Beaver Falls, Pa., manufacturer of portable deep well drills and steam shovels. Mr. Witherow is prominent in civic affairs at Pittsburgh, being vice-president of the Chamber of Commerce and also a director of the First National Bank at Pittsburgh and the Peoples-Pittsburgh Trust Co.

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RICHARD ARMSTRONG, recently associated with the Pittsburgh Steel Foundry Corpn., Glassport, Pa., has returned to the Union Steel Casting Co., Pittsburgh, in the capacity of metallurgist. He formerly held this same position with the company.

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MYRON C. TAYLOR, chairman of the board, United States Steel Corpn., returned to New York, Jan. 12, from a trip abroad.

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EUGENE W. PARGNY, president, American Sheet & Tin Plate Co., Pittsburgh, has been granted a year's leave of absence. C. W. BENNETT, vice-president in charge of operations, has been appointed acting president during Mr. Pargny's absence. D. A. BARRETT, who has been assistant vice-president for the past four years, has been named vice-president in charge of operations. Mr. Barrett is a native of St. Clairsville, Ohio, and began his career in the steel industry in 1897 at the Aetna-Standard works of the American company at Bridgeport, Ohio. He was later engaged at the Laughlin works and LaBelle works at Wheeling, W. Va., having been general superintendent of the latter plant. Prior to going to Pittsburgh four years ago, he had been, since 1915, manager of the Vandergrift, Pa., district for the American Sheet & Tin Plate Co. Mr. Barrett is a member of the American Iron and Steel Institute.

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FRED C. TRUBSHAW, superintendent of erecting engineers, Vilter Mfg. Co., Milwaukee, manufacturer of ice and refrigerating machinery and Corliss engines, has been elected a vice-president to fill the vacancy caused by the death of Edward F. Goes. Mr. Trubshaw has been associated with the company since 1911. He is the son-in-law of the late Theodore Vilter, founder and president of the company, who died in 1919.

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O. B. WILSON, formerly manager of the Cleveland office of The Brown Instrument Co., Philadelphia, has been appointed district manager of the territory comprising Texas, Louisiana and Southern Arkansas, with headquarters at Houston.

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CHARLES N. ALVAREZ, formerly director of purchases of E. W. Bliss Co., Brooklyn, N. Y., is now associated with the Traumatic Institute, Inc., Brooklyn, N. Y., as vice-president.

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GEORGE M. HUNTER, for many years division operating manager at Pittsburgh for the American Bridge Co., has been made vice-president in charge of operations for the company.

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W. S. SHIFFER, who has been identified for some time with the Reading Iron Co., Reading, Pa., recently as assistant general manager of sales, has

OBITUARY

and was graduated from Kansas State

been appointed general manager of sales. J. L. JACOBSON, formerly manager of sales in the Central region, succeeds him as assistant general manager of sales. Both will make their headquarters at 401 North Broad Street, Philadelphia. Other appointments include: G. H. WOODROFFE, manager of boiler tube sales; C. T. RESSLER, manager of railroad and marine sales, and L. K. SIMONS, manager of cut nail sales.

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G. SHARPLESS EASTBURN has been appointed assistant general sales manager of Central Iron & Steel Co., Harrisburg, Pa. Mr. Eastburn has been associated with the general sales department of the company for the past four years. His earlier steel experience was obtained through many years' connection with the former Worth Brothers Co., Coatesville, Pa.

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J. T. DILLON, JR., heretofore vice-president of the Struthers Wells-Titusville Corpn., Titusville, Pa., has been elected president, succeeding his father, J. T. DILLON, who has been made chairman of the board. H. W. CONARRO, T. J. DILLON and R. E. DILLON have been elected vice-presidents, and R. C. WHITE and R. S. HALL have been made treasurer and secretary respectively.

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HOWARD COONLEY, president, Walworth Co., Boston, has been elected president of the American Standards Association, and F. E. MOSKOVICS, chairman of the Marmon-Herrington Co., Indianapolis, has been made vice-president.

G. S. EASTBURN

J. T. DILLON, Jr.

Welded Construction for Heavy Equipment

Notable examples of the use of welding in the construction of heavy machinery were discussed in a meeting held at the Engineering Societies Building, New York, Jan. 10. The chief contributions were made by A. E. Gibson, vice-president, Wellman Engineering Co., Cleveland; H. G. Marsh, chairman of the trade research committee, Carnegie Steel Co., Pittsburgh, and E. Chapman, of Lukenweld, Inc., Coatesville, Pa. The meeting was held jointly by the New York section of the American Welding Society and the iron and steel and the machine shop practice divisions of the American Society of Mechanical Engineers. W. W. Macon, of THE IRON AGE, presided.

The meeting emphasized the utilization of rolled steel to serve as members of a machine or piece of equipment to be assembled into a whole by means of welding but particular attention was directed to making the design take into account the relatively precise knowledge available respecting the physical characteristics of the material. Generally speaking the contentions were that lighter products were achieved than otherwise at no greater cost over that of construction using other material and methods.

Mr. Gibson described at some length with the help of lantern photographs how welding and alloy steel had made possible the telescoping self-propelled mooring masts his company has built for the United States Navy for anchoring giant dirigibles. Other applications of welding he touched on included open-hearth charging cranes, welded top for gas producer, car dumpers, excavating buckets, etc., heavy industrial equipment sometimes combining castings in the welded rolled steel ensemble.

Mr. Marsh told of an unusually interesting development in the design of roll housings for a mill that will be the largest ever attempted. It is being built for the American Sheet & Tin Plate Co. for cold rolling wide strip. Lloyd Jones, of the E. W. Bliss Co., Salem, Ohio, is responsible for the marked departure in construction. In a word the housing frames will be made up of what are in effect laminations of armor plate, each group of laminations forming a vertical loop like the link of a gigantic chain (the side frame) and the area within the link or loop being the window of the housing and accommodating the bearings for the rolls within the link at both top and bottom. The cross-section of the link material is of the order of 31 x 34 in. Each of the two lofty links forming the housing will rest in a split steel casting as a base.

Mr. Chapman showed, among numerous illustrations, how the base of heavy lathes had been made up of rolled shapes welded with cross members in such a way as to supply a structure that would meet the torsional stresses and at the same time provide discharging hoppers for the full and ready disposal of the machine turnings.

Machine Tool Orders Gained in December

Machine tool orders gained in December according to the monthly report of the National Machine Tool Builders' Association. The index figure for last month was 35.8 as compared with 32 in November, during which there was a gain over October. The three months' average also increased to 31.7 from 29.6 in November. December was the best month since last June.

There was an increase in unfilled orders and shipments. Unfilled orders Dec. 31 were 45.4 compared with 42.2 at the end of November. Shipments were 32.3 against 28.9 the previous month.

The index figure of orders for all of 1932 was 35.4 compared with 73.9 in 1931. Shipments last year were 37.8 against 81.1 during the previous year.

Coal Operators Protest Against Freight Surcharge

WASHINGTON, Jan. 17.—Protests against continuance of rail surcharges on bituminous coal and coke have been filed with the Interstate Commerce Commission by the National Coal Association. Yesterday was the last day for filing protests against the surcharges which the railroads have asked the commission to extend indefinitely beyond March 31, when they were to have expired under the original order in the case.

1932 Iron Ore Output

WASHINGTON, Jan. 17.—Total output of iron ore mined in the United States during 1932 is estimated by the United States Bureau of Mines at 9,558,000 gross tons, a decrease of 69 per cent from that mined in 1931, and the lowest recorded since 1885. Ore shipped from mines is estimated at 5,364,000 gross tons, valued at $13,042,000, a decrease of 81 per cent in volume and 82 per cent in value as compared with 1931.

Electric Welded Pipe Patents Upheld

ing River at Newcastle Junction, Pa.,

OBITUARY

JAMES A. COE, president of James A. Coe & Co., Newark, N. J., died at the Newark Memorial Hospital on Jan. 5. He was born in Newark 86 years ago. Mr. Coe was a pioneer as an iron and steel dealer, having started the present business in 1869 with his brother-in-law, Joseph G. Crowell, under the name of Crowell & Coe.

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WALTER CARTER, director and general sales manager in Great Britain for J. J. Saville & Co., Ltd., Sheffield, England, died at his home in that city on Nov. 19, aged 58 years. He was one of the leading men in Great Britain connected with high-speed and alloy steels and spent the year 1902 in America introducing high-speed steel.

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NORMAN G. FERGUSSON, member of the firm of Fergusson, Wild & Co., Ltd., London, England, ore merchants, died on Dec. 28. During the war Mr. Fergusson was a member of the committee that regulated the distribution of iron and manganese ore.

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SAMUEL G. CORNSWEET, president Cornsweet Iron Co., Cleveland, died on Dec. 27 from injuries received in an automobile accident. He was active in the formation of the Institute of Scrap Iron and Steel, and at the time of his death was chairman of the board of the Cleveland-Detroit chapter of that organization.

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FRANK LACKNER, identified for more than 60 years with the H. K. Porter Co., Pittsburgh, died at his home in Glenshaw, Pa., on Jan. 4. He was born in Pittsburgh in 1854, and assisted in the construction of the first locomotive built by the Porter organization. He had retired from the company several years ago, and had been vice-president and a director of the Allegheny Valley Bank in Pittsburgh since its incorporation in 1900.

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WALTER MCINTOSH, superintendent of machine shops, Manitowoc Shipbuilding Corpn., Manitowoc, Wis., died Jan. 3 while seated at his desk. He was born and educated in Scotland, and came to America in 1900 to join the Union Iron Works, San Francisco. Later he was appointed master mechanic of the Illinois Central Railway and early in the war period joined the Manitowoc yards in charge of machine shops. This service was interrupted for three years after the Armistice by assignment to duties at the plant of the American Bridge Co. at Gary, Ind. He was 61 years old.

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ROBERT C. HANDLOSER, district manager at Detroit for the Motch & Merryweather Machinery Co., Cleveland, died of heart disease at his home on Jan. 3. Born 58 years ago at Trenton, N. J., he attended grammar school in Trenton and high school in New York, and was graduated in 1898 from Stevens Institute of Technology with a degree in mechanical engineering. After a brief period in New York, he spent a number of years in Europe selling American machine tools, making his headquarters part of the time in Berlin. He returned to the United States in 1907 to open the Detroit branch of the Notch & Merryweather company, continuing as district manager until his death.

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ISAAC HAMILTON MILLIKEN, vice-president of the McConway & Torley Co., Pittsburgh, died suddenly in the company's office on Dec. 30. He was 50 years of age, and became identified with the company soon after leaving school.

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LESTER E. FRAZIER, metallurgical engineer, American Chain Co. and associated companies, died at Terre Haute, Ind., on Jan. 6, after a month's illness.

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WILLARD S. PADEN, vice-president of the Covel-Hanchett Co., Big Rapids, Mich., died of pneumonia on Jan. 1, aged 68 years. He had been in the machinery sales business the greater part of his business life and had been identified with the Covel-Hanchett Co. for nearly 17 years.

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JOHN J. HARTLEY, since 1929 chief engineer of the Western Division of the Link-Belt Co., Chicago, died on Dec. 31, aged 39 years. He had been connected with the company for the past 23 years, having entered the drafting room as a boy.

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EMMET H. BIRNEY, for 10 years president of the Peerless Drawn Steel Co., Massillon, Ohio, of which he was the organizer, died suddenly Jan. 15 in Cleveland, where he had lived for the past few years. He was 60 years of age. Mr. Birney was born in Tuscarawas County, Ohio, and was graduated from Mount Union College, Alliance, Ohio, and Case School of Applied Science, Cleveland. For some time he was connected with the Jones & Laughlin Steel Corpn. About five years ago the Peerless Drawn Steel plant was sold to the Union Drawn Steel Co., and Mr. Birney moved to Cleveland, where he organized the Metal Spray Engineering Co., of which he was president.

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EDWARD H. KELLOGG, general manager of the Mine Safety Appliance Co., Pittsburgh, died at his home in that city on Jan. 9, aged 40 years. Mr. Kellogg was born at Russell, Kan., and was graduated from Kansas State College in 1911. He served as a captain in the chemical warfare service during the World War, having previously been employed by the Department of Agriculture and the Bureau of Standards in Washington. He had been associated with the Mine Safety company since 1919, and had been sales manager since 1927.

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JOSEPH MASHEK, widely known inventor in the printing press industry, died of pneumonia at his home in Kewaunee, Wis., on Jan. 7, aged 53 years. He was associated for many years with the Miehle Printing Press & Mfg. Co., and made numerous trips to foreign countries as an engineer. He retired in 1921 to devote his time to designing special machinery for printing plants.

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FREDERICK B. WESTON, for more than 30 years a sales representative of the Herrick Co., Boston, died suddenly on Jan. 10. He was 58 years old.

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CHARLES E. FARGO, formerly president of the Fort Dearborn Foundry Co., Chicago, died on Jan. 6. He was a member of the Illinois Manufacturers' Association.

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RUSSELL C. PARKER, vice-president and production manager, Parker Pen Co., Janesville, Wis., died after an illness of three weeks, on Jan. 8, aged 39 years. He was the eldest son of George S. Parker, founder and president of the company.

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WALTER ERNI, for many years manager, Prime Mfg. Co., Milwaukee, manufacturer of railroad supplies and locomotive accessories, died on Jan. 10 at his home in Palmyra, Wis. He retired from active service three years ago. He was 57 years old.

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THOMAS WILLIAMS, pioneer industrialist of Racine, Wis., died Jan. 6, aged 92 years. He was born in Wales in 1841, and came to America in May, 1849, settling at Racine. He retired in 1923.

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RICHARD GEORGE GOOSEN, superintendent, Kenosha Boiler & Structural Co., Kenosha, Wis., died Jan. 6, aged 52 years. He was born in Muskegon, Mich., and joined the Kenosha concern in 1915.

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ERNEST VON BORSIG, leading German engineer, is dead at the age of 63.

The fourth annual Greater New York Safety Conference will be held at the Pennsylvania Hotel, New York, March 1 and 2, under auspices of the metropolitan chapter of the American Society of Safety Engineers, engineering division of the National Safety Council.

Electric Welded Pipe Patents Upheld by U. S. Supreme Court

AFTER litigation extending over eight years, in which the Johnston patents covering electric resistance welding of tubing and pipe, owned by Steel & Tubes, Inc., Cleveland, have been uniformly upheld, the United States Supreme Court has declined to review the favorable outcome in the Court of Appeals. Steel & Tubes is a subsidiary of Republic Steel Corpn., Youngstown, where the Johnston process, originally developed to produce small, light-wall mechanical tubing, has been applied to commercial production of pipe in sizes up to 16 in. in diameter and in all standard wall thicknesses.

The litigation surrounding these patents dates back to 1924, when Steel & Tubes, Inc., sued the Mohegan Tube Co. in the United States District Court of the Eastern district of New York at Brooklyn. The patents were held valid and infringed. This decision was appealed to the Circuit Court of Appeals for the Second Circuit, in New York City, which, in May, 1925, sustained the original decision.

In December, 1929, suit was brought against the Greenpoint Metallic Bed Co., which was operating an electric welding machine built by a Chicago concern. Again the United States District Court of the Eastern district of New York held the Johnston patents valid and infringed. This case was not appealed and defendant settled the claim of damages out of court.

In July, 1930, suit was brought in the same court against the Jackson Tube Co., Brooklyn, which was operating another type of electric welding machine also purchased in this country. This suit included both the Johnston patents on electric welding and the Belmont patent for rolling down the burr left by the welding operation. The patents were again held valid and infringed, the decision being made that the Johnston patents covered edge-surface welding. This case also was not appealed and settlement of damages was made out of court.

Suit was then brought against the General Tube Co., Newark, N. J., in the United States District Court for the district of New Jersey, which held the patents valid but declared them infringed only when machines were operated in excess of 30 ft. per min. Both parties appealed this decision to the United States Circuit Court of Appeals for the Third Circuit. In October, 1932, this court handed down the opinion that the patents were valid and that the invention is not limited to any speed.

General Tube Co. then filed a petition for rehearing which was denied. A petition was then filed with the United States Supreme Court for a writ of certiorari, which was denied, bringing to a close an involved history of litigation.

The very broad interpretation given to the Johnston patents by the courts places them in a dominant position in the field of resistance welding of tubing and pipe. The Republic Steel Corpn. has invested millions of dollars in three electric weld pipe mills at Youngstown, having a nominal capacity of 40 miles of pipe per day. The demand for electric weld pipe, even during the depression, has made this division one of Republic's strongest assets.

Revenue Freight Declined 24.1 Per Cent in 1932

WASHINGTON, Jan. 17. — Complete reports for the year show that 28,194,828 cars were loaded with revenue freight in 1932, a reduction of 8,956,421 cars, or 24.1 per cent, from the number loaded in 1931, according to the American Railway Association.

Loadings of coal declined to 5,339,303 cars from 6,493,200 cars, a drop of 17.8 per cent. Loadings of coke decreased to 223,772 cars from 324,743, a reduction of 31.1 per cent. Loadings of ore declined to 210,759 from 874,673, a decrease of 75.9 per cent, the largest drop of any commodity whose loading is individually reported.

Valley Interests Again Urge Canalization

WASHINGTON, Jan. 17.—Declaring that the existence of the iron and steel industry in the Youngstown district is menaced by high rail rates, Mahoning and Shenango Valley interests urged quick relief through reduced water haul rates on Tuesday of last week before the United States Board of Engineers for Rivers and Harbors.

The hearing was in the nature of an appeal formally filed by the Chamber of Commerce of Youngstown from the unfavorable report of the division and Army engineers regarding improvement of the Beaver, Mahoning and Shenango rivers from the confluence of the Beaver River with the Ohio river at Beaver, Pa., to a favorable point within the Youngstown district.

The appeal proposes a modified project. It suggests that the question be resubmitted to the division and Army engineers and that the study be confined to a project for immediate improvement of the Beaver River from Beaver to its junction with the Mahoning River at Newcastle Junction, Pa., and improvement of the Mahoning to Struthers, Ohio, immediately below Youngstown.

It was estimated that the waterway would carry approximately 10,000,000 tons of inbound raw material annually, mostly coal, but also including coke. Outbound traffic was estimated at 1,025,000 tons, including 150,000 tons of steel products and 800,000 tons of limestone.

The board was told that competing districts with water transportation, because of low rates on inbound raw materials and in some cases because of low rates on outboard finished products, are getting business that otherwise would go to the Youngstown district.

The project would cost about $26,000,000, it was estimated. Savings were estimated at $6,000,0000 annually. Plants in the Youngstown district not directly connected with the river terminal would pay a 38c. switching charge.

British Pig Iron Output Higher in December

LONDON, ENGLAND, Jan. 14 (*By Cable*). Pig iron output in the United Kingdom gained in December over November, but steel ingot production fell off. The pig iron total for December was 284,500 tons against 267,700 tons in November, while ingot output was 430,400 tons compared with 473,800 tons in November.

Monthly totals for all of 1931 and 1932 follow:

1931	Pig Iron	Steel Ingots
Jan.	337,200	402,200
Feb.	318,200	486,400
March	357,100	500,100
April	323,200	397,400
May	346,500	435,100
June	323,800	428,900
July	317,000	428,700
Aug.	275,700	375,300
Sept.	248,200	400,500
Oct.	284,200	457,400
Nov.	296,400	459,200
Dec.	330,600	422,400
	3,758,100	5,193,600
1932		
Jan.	332,400	429,700
Feb.	318,100	480,600
March	335,600	462,800
April	316,900	433,300
May	315,300	416,900
June	311,400	459,300
July	292,600	430,300
Aug.	259,400	361,500
Sept.	260,400	430,300
Oct.	275,600	438,500
Nov.	267,700	473,800
Dec.	284,500	430,400
	3,569,900	5,247,400

Shipments of T-rail track of 60 lb. and heavier in December amounted to 1845 tons, according to the monthly report of the American Iron and Steel Institute. This was a slight gain over the November shipments of 1765 tons. The total for the year was 27,278 tons, compared with 60,901 tons in 1931 and the recent peak of 162,115 tons in 1929.

Revised Data on Distribution of Steel Products in 1932

RETURNS from 56 companies in the canvass by THE IRON AGE for statistics of distribution of steel last year indicate a larger output of steel bars than was shown by the preliminary figures compiled in the issue of Jan. 5. Identical companies reported shipments of 16,791,800 tons in 1931 and of 9,346,300 tons in 1932. Their 1932 aggregate was thus 55.6 per cent of that of 1931, and would indicate for the industry as a whole a finished steel production of 10,550,000 tons, (the 1931 output having been substantially 19,000,000 tons). In steel bars the tonnage of these companies last year appeared to be 56.9 per cent of that of 1931, so that the indicated bar tonnage for last year is of the order of 1,700,000 tons.

Calculations of the indicated tonnages for the various forms of steel are here tabulated, but it is to be noted that the grand total so obtained is 10,664,000 tons, or greater than could be supported by the 13,200,000 tons or more of ingots turned out last year, counting on the usual percentage of yield from ingot to the finished steel. Accordingly, the indicated tonnages are perhaps 5 per cent higher than the actual, as will be ascertained in the coming months by the American Iron and Steel Institute.

The additional returns brought figures from 47 companies detailing distribution, with a total coverage of 9,753,800 tons, but the tabulation of the consumer outlets could be made for only 9,196,900 tons, with totals for each consuming industry listed in the second table.

Steel Production of 1932

	Per Cent of 1932	Indicated Tonnage	Probable Tonnage
Rails	33.0	382,000	375,000
Track accessories, etc.	42.1	162,000	150,000
Plates	43.0	845,000	800,000
Structural shapes	49.8	1,027,000	975,000
Bars	56.9	1,727,000	1,650,000
Strips, hoops, bands, etc.	58.9	1,020,000	975,000
Black sheets for tinning	73.2	1,047,000	1,000,000
All other sheets	70.4	1,860,000	1,775,000
Tubes and pipe	42.5	607,000	575,000
Wire products	64.2	1,183,000	1,125,000
All other steel	61.7	804,000	750,000
Total steel	55.6	10,550,000	10,150,000

Consuming Output for Steel in 1932, According to Records of 47 Companies

	Tons
Railroads	875,800
Automobile industry	1,505,400
Shipbuilding	111,300
Highways	322,400
Buildings	1,124,400
Hardware and household utensils	138,100
Metal furniture	130,300
Agriculture	224,600
Mining and quarrying	54,800
Oil, gas and water (prod. and transp.)	348,600
Containers	992,900
Machinery	143,600
Bolts, nuts, rivets, etc.	129,000
Electrical manufactures	132,100
Power development	91,200
Manufacture of wire	137,400
Chemical equipment	38,000
Jobbers	1,336,700
Steel plants and foundries	214,100
Export	307,700
Miscellaneous	838,500
	9,196,900

Scrap the Only Item to Gain in Iron and Steel Exports in 1932

WASHINGTON, Jan. 17—Scrap was the only product in the entire iron and steel list which showed a gain in exportation in the first 11 months of 1932 when compared with the corresponding period of 1931. Outgoing shipments of old material, aggregating 197,347 gross tons, far exceeded those of any other item in the first 11 months of last year. They represented 36.4 per cent of the total iron and steel exports, amounting to 540,573 tons. The principal countries taking American scrap were Japan and Canada. These two countries also consumed 60 per cent of the total iron and steel exports, Japan leading with 171,925 tons and Canada ranking second with 157,134 tons.

Exports of Iron and Steel from the United States
(In Gross Tons)

	November		11 Months Ended November	
	1932	1931	1932	1931
Pig iron	160	717	2,253	6,313
Ferromanganese	....	2	28	1,253
Scrap	29,184	6,158	197,347	130,152
Pig iron, ferroalloys and scrap	*29,344*	*6,877*	*199,628*	*137,718*
Ingots, blooms, billets, sheet bar	31	4,299	1,620	7,873
Skelp	4,068	2,201	25,298	54,231
Wire rods	472	1,353	13,710	29,963
Semi-finished steel	*4,571*	*7,853*	*40,628*	*92,067*
Steel bars	1,106	5,590	13,938	39,907
Alloy steel bars	107	136	1,547	2,880
Iron bars	24	48	587	986
Plates, iron and steel	957	1,407	9,583	41,256
Sheets, galvanized steel	1,408	1,993	23,733	43,787
Sheets, galvanized iron	121	131	1,324	4,030
Sheets, black steel	2,929	5,263	35,965	85,464
Sheets, black iron	128	217	2,386	5,495
Hoops, bands, strip steel	1,276	1,275	16,886	26,617
Tin plate; terne plate	2,275	6,528	35,485	78,613
Structural shapes, plain material	1,014	2,789	14,248	84,342
Structural material, fabricated	1,364	2,559	16,210	30,443
Tanks, steel	597	1,064	2,688	11,944
Steel rails	500	2,214	10,983	28,971
Rail fastenings, switches, frogs, etc.	257	1,240	3,606	7,727
Boiler tubes	450	335	3,366	6,725
Casing and oil-line pipe	1,279	717	16,831	20,967
Pipe, black and galvanized, welded steel	1,790	5,330	25,191	51,263
Pipe, black and galvanized, welded iron	355	262	3,584	4,889
Plain wire	404	1,241	7,653	13,185
Barbed wire and woven wire fencing	904	1,051	16,484	22,475
Wire cloth and screening	51	49	592	819
Wire rope	107	74	1,448	2,319
Wire nails	711	618	6,851	7,677
Other nails and tacks	249	214	3,067	3,460
Horseshoes	18	8	98	143
Bolts, nuts, rivets and washers, except track	206	261	2,407	4,577
Rolled and finished steel	*20,587*	*42,614*	*276,741*	*630,966*
Cast iron pipe and fittings	283	335	7,937	19,933
Malleable iron screwed fittings	119	225	1,541	4,258
Car wheels and axles	257	220	2,641	5,734
Iron castings	370	323	2,833	4,096
Steel castings	42	55	1,104	3,040
Forgings	170	641	3,463	7,087
Castings and forgings	*1,241*	*1,799*	*19,519*	*44,148*
All other	298	413	4,057	6,834
Total	56,041	59,556	540,573	911,733

Sources of American Imports of Iron Ore
(In Gross Tons)

	November		11 Months Ender November	
	1932	1931	1932	1931
Chile	.....	45,276	218,492	728,063
Cuba	11,000	.....	77,000	78,000
Spain	.....	.....	245	38,191
Sweden	.....	25,532	7,037	83,554
French Africa	.....	5,300	10,000	70,472
Canada	.....	.....	807	584
Russia	15,500	17,756	154,770	255,062
Other Countries	13,666	261	106,011	121,935
Total	40,166	94,125	574,362	1,375,861

SUMMARY OF THE WEEK'S BUSINESS

Steel Business Gains a Little; Sheet and Wire Prices Lower

Reductions of $2 to $6 a Ton on Wire Products—Some Grades of Sheets Show Further Decline—Ingot Output at 16 Per Cent This Week

A MODERATE expansion in miscellaneous orders for steel and a continuance of releases of automobile materials and tin plate have brought a further rise in steel ingot production for the country as a whole to 16 per cent of capacity, but this minor improvement has been accompanied by pronounced price weakness, especially in sheets and wire products and to some extent in concrete reinforcing bars. Heavy melting steel scrap at Pittsburgh has lost its 25c. a ton advance of a week ago.

Cleveland mills, aided by automobile orders, have attained an ingot producing rate of 41 per cent, which was equaled there in only one week of 1932. The Wheeling district is holding at 35 per cent, mainly because of tin plate requirements. A Detroit plant is operating five of its six open-hearth furnaces, and an Ohio maker of sheets has been booking business in the past week equivalent to 30 per cent of its capacity. At Chicago, steel orders and specifications have reached a total that was exceeded in only a few weeks of last year, but production has not yet risen above the recent low of 9 per cent. Valley and other northern Ohio mills are up to 17 per cent, while the Pittsburgh district is barely able to hold at 14 per cent, two fairly large plants in that area being completely idle.

UNLESS there is a continued gain in orders from the miscellaneous consumers of steel, together with some pick-up in building construction and railroad buying, the present rate of steel operations may not hold, as the continuance of automobile manufacturing schedules is dependent upon the development of a larger volume of retail sales of cars.

However, some railroads are working on their 1933 programs, and rail inquiries from at least two or three roads are expected this month. The appearance of inquiries for some private building work is an encouraging factor in structural steel and reinforcing bars, as public projects have been the main support of these products for some time. The War Department is planning for the construction of a number of breakwaters on the Great Lakes, and, if sheet piling is used, 55,000 tons will be required. Bids are also being taken on the San Francisco-Oakland bridge, which will eventually take upward of 150,000 tons of steel. In Michigan, an $8,000,000 road program, including bridges, is proposed.

PRICE weakness, which has been most marked in sheets, has extended to wire products, which have been reduced $2 to $6 a ton. Wire rods and plain wire are off $2, nails are down $3, smooth galvanized wire has declined $4 and galvanized barbed wire is $6 lower. Extras on spring wire have also been cut. Galvanized sheets have experienced a total drop of $4 a ton during the past two weeks, and reductions have occurred in some other grades, especially cold-rolled. The sheet price situation is so unsettled that producers scarcely know what to quote to obtain an order, and consumers are making offers that are considerably below the lowest prices that mills have thus far been willing to accept. Weakness in sheets, which at first was most pronounced at Detroit and in open bids taken recently by the State of Ohio on 1000 tons of license-plate stock, has spread rapidly over the country.

Although merchant bars are firm, sharp concessions have developed on reinforcing bar business, a leading producer having sold 500 tons to an Eastern distributer at a concession of several dollars a ton. Plates have been sold in the East at prices ranging from 1.40c. to 1.60c. a lb., Coatesville, with the higher figure now representing the top of the general market. Fabricated structural material is being offered at very low prices, but shapes are being fairly well held, some low prices having been withdrawn by mills.

The decline in prices of some steel products is believed to make more certain a further reduction in steel workers' wages, on which an announcement is expected soon.

PIG IRON shipments are gaining this month in some areas, notably at Chicago and Cleveland, while other districts show no gains. Manchurian pig iron is being offered in Philadelphia at $11.50 a ton, or $1 below the lowest domestic furnace price in that district. A Buffalo merchant plant, with four furnaces, is now completely idle, but has ample stocks. A recent development of the depression is the abandonment of foundry departments by many general manufacturers, a factor which ultimately will benefit the jobbing foundries.

WITH the decline in plain wire to 2.10c., the lowest price at which this product has been quoted since 1916, THE IRON AGE composite price for finished steel is now at 1.923c. a lb., or 90c. a net ton below the lowest figure of the 1921-1922 depression. Nails and box annealed sheets are down to 1915 levels, while galvanized sheets, nominally at 2.65c. a lb., are well below any price quoted in the present century. THE IRON AGE pig iron composite price is unchanged at $13.56, but the heavy melting scrap composite has reverted to $6.75, the figure in effect at the beginning of the month, last week's rise at Pittsburgh having been wiped out.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Jan. 17, 1933	Jan. 10, 1933	Dec. 20, 1932	Jan. 19, 1932
Per Gross Ton:				
No. 2 fdy., Philadelphia	$13.34	$13.34	$13.34	$15.64
No. 2, Valley furnace	14.50	14.50	14.50	15.50
No. 2 Southern, Cin'ti	13.82	13.82	13.82	13.82
No. 2, Birmingham	11.00	11.00	11.00	11.00
No. 2 foundry, Chicago*	15.50	15.50	15.50	16.50
Basic, del'd eastern Pa.	13.50	13.50	13.50	16.25
Basic, Valley furnace	13.50	13.50	13.50	15.00
Valley Bessemer, del'd P'gh.	16.89	16.89	16.89	17.89
Malleable, Chicago*	15.50	15.50	15.50	16.50
Malleable, Valley	14.50	14.50	14.50	16.00
L. S. charcoal, Chicago	23.17	23.17	23.17	23.17
Ferromanganese, seab'd carlots	68.00	68.00	68.00	75.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$40.00	$40.00	$40.00	$43.00
Light rails at mill	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	28.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	27.00
Slabs, Pittsburgh	26.00	26.00	26.00	28.00
Forging billets, Pittsburgh	31.00	31.00	31.00	34.00
Wire rods, Pittsburgh	*35.00*	37.00	37.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.50

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.50
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.55
Bars, New York	1.95	1.95	1.95	1.85
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	*1.798*	1.898	1.898	1.798
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.50
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.76775
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh	1.45	1.45	1.45	1.40
Cold-rolled strips, Pittsburgh	1.90	1.90	2.00	1.90

Finished Steel

Per Lb. to Large Buyers:	Jan. 17, 1933 Cents	Jan. 10, 1933 Cents	Dec. 20, 1932 Cents	Jan. 19, 1932 Cents
Hot-rolled annealed sheets, No. 24 Pittsburgh	2.00	2.00	2.10	2.15
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.10	2.10	2.20	2.30
Sheets, galv., No. 24, P'gh	*2.65*	2.75	2.85	2.80
Sheets, galv., No. 24, Chicago dist. mill	*2.75*	2.85	2.95	2.90
Hot-rolled sheets, No. 10, P'gh	1.45	1.45	1.55	1.60
Hot-rolled sheets No. 10, Chicago dist. mill	1.55	1.55	1.65	1.75
Wire nails, Pittsburgh	*1.80*	1.95	1.95	1.95
Wire nails, Chicago dist. mill	*1.85*	2.00	2.00	2.00
Plain wire, Pittsburgh	*2.10*	2.20	2.20	2.20
Plain wire, Chicago dist. mill	*2.15*	2.25	2.25	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh	$4.25	$4.25	$4.25	$4.75

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh	*$8.25*	$8.50	$8.75	$10.25
Heavy melting steel, Phila.	6.75	6.75	6.75	7.50
Heavy melting steel, Ch'go	5.25	5.25	5.25	7.25
Carwheels, Chicago	7.75	7.75	7.00	7.50
Carwheels, Philadelphia	8.00	8.00	8.50	10.50
No. 1 cast, Pittsburgh	9.00	9.00	9.50	10.00
No. 1 cast, Philadelphia	8.00	8.00	8.00	10.00
No. 1 cast, Ch'go, (net ton)	6.25	6.25	6.25	7.50
No. 1 RR. wrot., Phila.	7.50	7.50	7.50	8.50
No. 1 RR. wrot., Ch'go, (net)	4.50	4.50	4.00	6.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$1.75	$1.75	$1.75	$2.25
Foundry coke, prompt	2.50	2.50	2.75	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	5.00	5.00	5.00	7.62½
Electrolytic copper, refinery	4.75	4.75	4.75	7.25
Tin (Straits), New York	**22.70**	22.60	22.90	22.05
Zinc, East St. Louis	*3.00*	3.10	3.12½	3.00
Zinc, New York	*3.37*	3.47	3.49½	3.37
Lead, St. Louis	2.87½	2.87½	2.87½	3.55
Lead, New York	3.00	3.00	3.00	3.75
Antimony (Asiatic), N. Y.	**6.00**	5.45	5.40	6.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Jan. 17, 1933	1.923c. a Lb.	$13.56 a Gross Ton	$6.75 a Gross Ton
One week ago	1.936c.	13.56	6.83
One month ago	1.948c.	13.56	6.92
One year ago	1.933c.	14.64	8.33
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1932	1.977c., Oct. 4	1.926c., Feb. 2	$14.81, Jan. 5	$13.56, Dec. 6	$8.50, Jan. 12	$6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Steel Orders Barely Support Current Operations

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PITTSBURGH, Jan. 17—January improvement in steel orders, which was promised earlier in the first half of the month, has been checked in this district. Releases have fallen off with some companies in the last few days, and aggregate tonnage is barely holding its own. A few makers serving the automotive industry report that their January business has fallen under the December level, and releases from that source in the last few days indicate that a falling off in motor car production may be expected later in the month.

Orders for fabricated structural steel and reinforcing bars are also in lighter volume than in the preceding month, and the new year has brought little impetus to buying by the railroads. Tin plate releases are well sustained, but production is admittedly higher than shipments. Jobbers of wire products and sheets seem inclined to postpone replenishment of their inventories until consumptive outlets show definite encouragement. Pipe shipments to the oil country are fairly well maintained, but the other grades are particularly dull.

Steel ingot output in the Pittsburgh district is barely being maintained at recent levels this week. Although one large plant resumed production Friday after a fortnight's suspension, two important independent mills which have been operating two or three of their open-hearths very steadily are not making steel this week. As a result, the Pittsburgh district barely averages 14 per cent. Steel production in the Valleys and nearby northern Ohio plants is a little higher at 17 per cent, having benefited by tin plate orders and sheet and strip demand from the automotive industry. In the Wheeling district, the requirements of tin mills have barely offset reduced demand from other sources to hold at the rate of 35 per cent.

Among finishing mills, tin plate and sheets alone have shown any gain in the last week. The tin plate industry as a whole is engaged at slightly less than 50 per cent of capacity, although shipments are not being made at so high a rate. Sheet production is up to about 17 per cent, but recent tonnage hardly indicates that this rate can be held.

Price weakness has been given further prominence by the situation in sheets. Quotations on some grades of sheets can be said to be virtually demoralized, and galvanized and light cold-rolled material are quotable at a further reduction of $2 a ton. Even lower prices are heard, and consumers are demanding that their usual sources of supply meet the almost fantastic quotations of competitors. Price declines have also been extended into the wire market, where reductions ranging from $2 to $6 a ton have occurred. Strenuous efforts are being made to stabilize heavy hot-rolled steel prices, but reinforcing bars are still subject to very sharp concessions.

Valley steel output up to 17 per cent, but Pittsburgh district barely holds at 14 per cent, while Wheeling is still at 35 per cent.

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Prices of wire products break and further weakness develops in sheets.

* * *

Scrap market weak, with declines in heavy melting steel and low phosphorus specialties.

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Pig Iron

With scarcely any of the foundries in the district running more than one day a week, no improvement in orders for pig iron has been reported. Carload lots constitute the bulk of current orders, and truck delivery is still resorted to for very small lots.

Semi-Finished Steel

Requirements of non-integrated tin plate makers have improved slightly since the first of the year. Billets, slabs and sheet bars are quoted at $26, Pittsburgh, and forging billets at $31. Wire rods have been reduced $2 a ton by a leading maker to $35, Pittsburgh or Cleveland.

Bars, Plates and Shapes

Both structural steel and reinforcing bar awards have been lighter this month than in the corresponding December period, and are made up almost entirely of State projects. Federal jobs are slow to be released, and projects for which aid has been obtained from the Reconstruction Finance Corpn. usually move rather slowly. The barge market is showing more life, a Pittsburgh builder having taken six units from a private company; 1500 tons of plates will be required. Three Government barges for Chicago, requiring 480 tons, have also been placed with a Pittsburgh district yard. Otherwise plate demand is rather dull, as the railroads are releasing no tonnage for car building purposes, and little oil tankage steel is being placed. Demand for merchant bars from miscellaneous manufacturing consumers is a little heavier than in December, but movement to the automobile industry has not improved very much.

Efforts are being made to strengthen the 1.60c., Pittsburgh, asking price on heavy hot-rolled products, but the market is still very weak in some localities, particularly on plates and reinforcing bars. Merchant bars are fairly well held.

Rails and Track Accessories

Most of the carriers have now completed their budget activity for 1933, but appropriations for actual purchases are slow to come through. The Pennsylvania took bids Jan. 16 on 5000 kegs of spikes. The Chesapeake & Ohio is inquiring for a small tonnage of screw spikes. No recent rail releases are reported, and the local mill may not operate this month. Light rails are particularly quiet, with no significant buying reported in several months. Prices on rails and track accessories are being maintained.

Cold-Finished Steel Bars

Releases have failed to show much of a gain over December in the aggregate, although some companies report improvement. Operations continue at a very low rate, but the base price of 1.70c., Pittsburgh, is holding.

Tubular Goods

The pipe business this month has shown mixed trends, with improvement reported in some lines, while others have fallen off. The oil industry is still accounting for a fairly large share of the total tonnage, but shipments of such products have fallen under December with some producers. Standard pipe generally shows little change, while boiler tubes are slightly more active. The line pipe market is very dull, but some tentative inquiries for spring work have already appeared. Pipe discounts are holding rather well in most cases.

Sheets

The volume of releases has received no particular impetus in the past week, but some companies report improvement in their aggregate orders. Shipments to the automotive

industry are no heavier than they were last month, but Detroit companies have not indicated any curtailment in their requirements.

Recent price weakness has developed into what might almost be termed demoralization on some products. Galvanized sheets are now offered rather freely at 2.65c., Pittsburgh, and consumers indicate that much lower prices have been quoted to them. Light cold-rolled material is rather commonly available at 2.30c., Pittsburgh, and large buyers are demanding even lower prices. The other grades are quotably unchanged, although large buyers have been able to get their usual differentials under the minimum published figures.

Tin Plate

Specifications continue to gain, but have not improved rapidly enough to justify the sharp upturn in operating schedules which has occurred in the last two weeks. The industry is engaged this week at only slightly under 50 per cent of capacity, with several large independents in this district running at an even higher rate. Some of these companies are admittedly manufacturing material for stock, but others are confining their production rather closely to shipments. A few large users are still hesitant about their 1933 contracting, but the price is still well maintained.

Strip Steel

Demand is holding its own, but no further improvement has been reported in the last week. Shipments to the automotive industry are holding up fairly well, but demand from other sources is confined to minimum manufacturing requirements. Hot-rolled strip is still holding at 1.45c., Pittsburgh, and cold-rolled is represented by a range of 1.90c. to 2c., Pittsburgh.

Wire Products

Consumers in this district have received quotations on wire products reflecting reductions of from $2 to $6 a ton. Nails are quoted at $1.80 a keg, manufacturers' wire at 2.10c. a lb., and spring wire at 3.10c. Size extras on spring wire have also been sharply reduced. On merchant products the largest reduction was on galvanized barbed wire, which is quoted off $6 a ton from recent levels. Fencing has been reduced $5 a ton to $50. The wire market had been comparatively firm until recently, and the above reductions were something of a surprise to local producers. Nevertheless, the figures have been quoted so generally that it is expected they will be met by all mills.

Coal and Coke

With domestic coke in lighter demand than a month ago, aggregate movement is no heavier than it was in December. Many foundry consumers have not resumed production since the holidays. Demand for the furnace grade is very light. Prices show no particular weakness, and occasional sales at low figures are reported.

Scrap

With the railroad lists out of the way, No. 1 heavy melting steel has returned to its previous level, although the market shows no decided weakness. No sales into consumption are reported, but the principal grades are not in plentiful demand and dealers are having difficulty in purchasing steel at less than $8. While most dealers are willing to make offers to sell at $8.50, small lots are occasionally available at less. Specialties are weaker in the absence of demand, and some of the low phosphorus grades have eased off. With no sales reported upon which to base prices, quotations on the other grades remain nominal.

Continental Steel Stronger on Demand From the Far East

Prices on Some Products Higher—Inquiry in Great Britain Broadening But Business is Slow

LONDON, ENGLAND, Jan. 16—Continental steel is stronger on continuance of the Far Eastern demand. In Great Britain there is a broadening of inquiry, but very little business has resulted.

The Continental Raw Steel Cartel, which met recently, adjourned until Jan. 27, as no agreement could be reached regarding the establishment of selling agencies.

Welsh tin plate business is quiet, but prices are firmer because of well-filled order books. The Tin Plate Conference has decided to continue the pooling plan until September, 1934, or later. The outlook is considered quite favorable. Last year's tin plate exports, at 463,000 tons, showed an increase of about 63,000 tons over 1931.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£4 17s. 6d. to £5 7s. 6d.
Black sheets, Japanese specifications	£11
Tin plate, per base box	15s. 9d. to 16s. 6d.
Steel bars, open-hearth	£7 17½s. to £8 7½s.
Beams, open-hrth.	£7 7½s. to £7 17½s.
Channels, open-hearth	£7 12½s. to £8 2½s.
Angles, open-hearth	£7 7½s. to £7 17½s.
Black sheets, No. 24 gage	£8 5s.
Galvanized sheets, No. 24 gage	£10 10s. to £10 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

Billets, Thomas	£2 2s.
Wire rods, No. 5 B.W.G.	£4 10s.
Black sheets, No. 31 gage, Japanese	£11 5s.
Steel bars, merchant	£2 10s. to £2 12s. 6d.
Beams, Thomas	£2 3s.
Angles, Thomas, 4-in. and larger	£2 8s.
Angles, small	£2 10s.
Hoops and strip steel over 6-in. base	£3 7s. 6d. to £3 10s.
Wire plain, No. 8.	£5 7s. 6d.
Wire nails	£5 10s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

United Kingdom exports of pig iron in December were 16,000 tons, of which 5800 tons went to the United States. Exports of all kinds of iron and steel in December were 164,000 tons, bringing the total for the year to 1,888,000 tons.

Mexico has placed warship orders with Spain under the Spanish Government's provisional credit of 70,000,000 pesos.

San Francisco-Oakland Bridge Bids Called For

SAN FRANCISCO, Jan. 16.—Progress is being made on the San Francisco-Oakland bridge with the call for bids on four more contracts requiring 2240 tons of reinforcing steel, 62,165 tons of structural steel and 18,700 tons of cable. Bids will be taken March 2 on the East Bay substructure (contracts 4 and 4A) involving 21 piers between Yerba Buena Island and Oakland and requiring 1140 tons of reinforcing bars and 165 tons of structural steel. On March 7 bids will be taken on the West Bay super-structure, cables and attachments; this unit (under contracts 6 and 6A) will be between San Francisco and Yerba Buena Island. Work involves the following estimated quantities: 62,000 tons of structural steel, 1100 tons of reinforcing bars, 18,700 tons of cable, 900 tons of cast steel, 350 tons of heat-treated eyebars, 255 tons of carbon-steel eyebars, 280 tons of nickel steel, 300 tons of manganese steel rivets, 840 tons of cable castings. The estimated cost of contracts 4 and 4A is $6,200,000, while contracts 6 and 6A are estimated at $16,500,000. It is estimated that the eight and one-quarter mile bridge will require a total of 152,000 tons of structural steel and 17,000 tons of reinforcing bars before it is completed.

It is reported that the market is weak on plates and reinforcing bars, although structural steel remains firm.

Chicago Market Shows Expansion in Sales of Finished Steel

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CHICAGO, Jan. 17—Favorable developments in the Chicago steel market are growth in sales and specifications. Only six weeks in 1932 can boast a better sales volume than that of the past week. However, this situation is not reflected in mill output, which still stands at close to 9 per cent of ingot capacity.

Some private work is making its appearance in the reinforcing bar market, and plates are again moving for oil country use. Railroad business is slack, and the impression is that purchases by that group will depend on an upward trend in earnings. A significant development is that only recently several Western railroads have had to borrow coal cars, their own supply being inadequate to meet sudden upward fluctuations in loadings.

Prices for finished steel remain under pressure. Quotations on wire have yielded $2 a ton and some nail business has been taken at $1.80 a keg, Pittsburgh.

Pig Iron

Sales of Northern foundry iron remain at recent levels, but inquiries, especially of the larger size, are more numerous. Shipments are climbing slowly and the whole situation is one which seems to assure a January melt well above that of December. This improvement is miscellaneous in character and is less dependent on automobile foundry work, which is gradually tapering. Manufacturers with foundry departments are giving closer attention to their casting costs, and there is a very definite trend toward buying needs in the open market. Some manufacturers are closing their foundries for all time, liquidating equipment and offering the buildings for rent.

Bolts, Nuts and Rivets

This market still drags, with no indicated improvement since the first of the year.

Rails and Track Supplies

This market is quiet except for the fact that several Western railroads are starting on their plans for spring track work. It is generally understood that the size of the programs will depend on income of the railroads. Use of accessories is steady.

Wire Products

Weak spots, which have been apparent for some time past, have recently spread very rapidly, with the result that most producers are now quoting prices that are down $2 a ton. Bright wire is now quotable at 2.10c. to 2.20c., Pittsburgh and Cleveland, and standard wire nails are priced at $1.85 to $1.95 per keg, base. This situation arises at a time when new orders are slowly gaining and fresh inquiries indicate that further improvement is in sight. The largest users are automobile manufacturers, with jobbers taking second place.

Although ingot output in Chicago district has not risen above 9 per cent, sales and specifications have gained.

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Prices of wire products are $2 a ton lower.

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Scrap market shows a little strength, particularly on railroad items.

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Reinforcing Bars

A number of quiet projects are developing, and dealers are inclined to the view that the outlook is more favorable now than a year ago. It now develops that not over 20 per cent of the November and 10 per cent of the December road bids for the State of Illinois have been acted upon. The remaining contracts are to be placed by the new administration. Prices are weak in the face of very light awards, all of which are of small size.

Cast Iron Pipe

Chicago has obtained Federal funds and is about to launch a program which includes construction of a new water pumping station and the use of about 8000 tons of cast iron pipe. A Springfield, Ill., job has been taken by a contractor in that city. Though general awards have been made at Wilmette, Ill., contractors are standing by to make certain that the legal atmosphere is clear before placing orders for needed materials.

Bars

Fresh inquiries show rather a substantial increase over those of the early part of the month, but as yet very few of these have been translated into orders. The average size of current orders is larger, but this is a direct result of activity of automobile manufacturers. Agricultural implement makers are talking more cheerfully, but they are not yet ready to take additional steel. Here and there more workers have been added to railroad shop forces, but use of steel is still very light. Mill steel bar prices are steady at 1.70c. a lb., Chicago.

Cold-Rolled Strips

Output is about 15 per cent of capacity. Prices are steady, in the range from 2.20c. to 2.30c. a lb., delivered Chicago.

Plates

Miscellaneous orders for tank plates total 600 tons, and inquiry is out for 700 tons for repairs to Lake boats. The Denver, Col., pipe project, calling for 4000 tons of plates, is being temporarily blocked and bids have not been opened. A brewery at Milwaukee will make use of 500 tons of plates.

Structural Material

A small amount of private work has been let, and fresh inquiries call for a small tonnage of like character. This change from straight public work is small, but it is a trend that is eagerly looked for by fabricators. Competition is still exerting extreme pressure against fabricated material prices.

Sheets

This market remains moderately active, with prices leaning rather decidedly toward the weak side.

Scrap

The complexion of the local scrap market is much the same as a week ago. Certain railroad grades are still scarce, dealers being in need of them to fill old orders. Prices for these grades are strong. Demand for other grades is marking time. One Western railroad offered a list of about 15,000 tons and then withdrew it because of low prices and lack of bids on some grades. It is reported that several railroad scrap preparing yards are well filled, and there is growing disposition to move some of this scrap to make room for new accumulations. A weakened market would result from the sudden appearance of these tonnages.

Detroit Scrap Market Has a Firmer Tone

DETROIT, Jan. 17—Although purchases by consumers still are meager, the tone of the local scrap market is firmer. Dealers are quietly acquiring further stocks, especially of open-hearth items, in anticipation of an early pick-up in mill buying.

Eastern Pennsylvania Market Sluggish; Prices Are Weak

Sheets, Wire Products and Scrap Decline—Manchurian Pig Iron Offered at $11.50, Philadelphia

PHILADELPHIA, Jan. 17—The market continues to be sluggish. Prices are easier in sheets, wire products, cold-rolled strip and scrap. Prices on plates are still irregular and weak. While shapes are somewhat stronger, they still reflect unsteadiness. Merchant bars show greater firmness than reinforcing bars. Actually, however, demand is so light that no real test of the market generally has been made.

It is reported that the Reading Railroad is asking for bids on about 1000 tons of steel for completion of its original car repair program. It has not been definitely announced as to whether this carrier will increase the program. The Pennsylvania Railroad has taken bids on 5000 kegs of spikes, which will be used, it is said, on the electrification of its line between Paoli, Pa., and New York.

One plant in this district will start a 12-in. bar and 28-in. structural mill this week.

Open-hearth output in this district is estimated at 10½ per cent of capacity.

Pig Iron

Bookings of carload foundry tonnages are fairly numerous. There is no demand for steel-making grades. Of the 502 tons of Manchurian foundry iron received recently at Philadelphia, 100 tons is said to have gone as a trial order to a pipe maker on the Delaware River. The remainder is reported to have been shipped on consignment and to be offered at around $11.50, landed, duty paid. This is $1 under the furnace price of domestic No. 2 foundry iron.

Plates, Shapes and Bars

Demand is extremely quiet. Railroads do not give any indication of coming into the market for important requirements in the near future. The Reading is reported to be asking for bids on about 1000 tons to be used in completing the repair of 3000 cars. Sanford Brooks, Baltimore, was the low bidder for the general contract to build a State highway bridge over the Choptank River near Easton, Md. The structure will require 900 tons of steel.

Imports

The following iron and steel imports were received here last week: 4000 tons of chrome ore from Turkey, 50 tons of iron ore from Spain, 20 tons of steel bands and 15 tons of steel bars from Belgium.

Scrap

Sales in this district the past week have established prices of $4.50 to $5 on No. 2 heavy melting steel and $8 for heavy breakable cast.

Birmingham Steel Output Picks Up This Week

BIRMINGHAM, Jan. 17—The first half of January closely resembled the holiday period of last month, so limited were foundry activities and the need for pig iron. Foundries have had practically no business since Christmas, and this applies to pipe as well as to jobbing plants. This condition is fully reflected in the present rate of furnace operations. Of the two stacks in Alabama that had been active since the first of the year, one was banked last week, leaving only one producing. This week there is a return to two, the Tennessee company having resumed production on Sunday. The other active stack is being run by Sloss-Sheffield Steel & Iron Co. Pipe plant operations are due to drag all through this month, but the outlook for February is slightly more encouraging. Inquiries the past week show an improvement and there is said to be more tonnage in sight than in a long while. One large pipe plant, which was closed for three weeks prior to Jan. 9, operated only one unit for three days last week, and now expects to be idle for another two weeks. The pig iron quotation of $11 for the Southern market is holding.

Steel

The steel market is looking to highway construction and to jobbing requirements for its main support during the next few weeks. Since last fall, Southeastern States have placed road contracts costing in excess of $30,000,000 and a considerable portion of this work will soon reach an advanced stage. Larger bar orders are beginning to appear, as the needs for material increase. Jobbers were somewhat slow in placing business during the early part of January, but there is now a better movement and it is expected this will grow during the latter part of the month. Industrial demand is small, and the railroads are buying only a small amount of miscellaneous products for routine maintenance. Quotations are unchanged. Open-hearth operations have returned to five active units for this week. Last week only two units were working, the Tennessee company having shut down three for the week.

Scrap

The market continues to drag, as it has for months, with hardly any buying and contract shipments at a minimum.

Cincinnati Pig Iron Shipments Increase

CINCINNATI, Jan. 17—A slight improvement in pig iron shipments, especially to automotive foundries, the past two weeks has contributed a brighter aspect to the district market despite the slowness of bookings. New business is confined to single car orders, and the past week's total was about 400 tons. Inquiry for substantial tonnages is lacking, although inventories of district melters are low. Southern iron is steady at $10, base Birmingham, but demand is almost negligible. The weakness of Northern prices is giving way to a general tendency of furnaces to resist concessions on silicon differentials. A few stove foundries are still operating at a fair rate, but the general melt is unchanged.

Steel

Better specifications from automotive manufacturers the past week brought rolling schedules of district mills above 30 per cent of capacity output. In fact, the leading interest in this district indicates that the general interest in sheets appears to be improving. Weakness has developed in prices. Future business is small, current bookings being for immediate shipment.

Scrap

While mills resist heavier inventories of scrap until business prospects improve, shipments of blast furnace material on contract continue at fair rate. Dealers' bids are unchanged, but absence of dealings has contributed a weak undertone to the entire list.

Air Conditioning May Be "Spark-Plug" in Upturn

There has been a rapid increase in the number of firms prepared to push the sale of air-conditioning equipment, according to Walter H. Rastall, chief of the Commerce Department's industrial machinery division, who stated that more than 50 firms are now engaged in this business.

Mr. Rastall pointed out that many economists look upon this industry as one which may prove to be the "spark-plug" in the next business upturn.

Cleveland Steel Ingot Output at Last Year's Highest Rate

Production at 41 Per Cent of Local Capacity—Influenced Mainly By Orders for Automobile Sheets

CLEVELAND, Jan. 17.—Steel ingot production in Cleveland was increased to 41 per cent of capacity late last week, a gain of six points, by the putting on of two open-hearth furnaces by the Otis Steel Co., which will start up another furnace tonight, making seven out of eight operating.

New releases from some of the automobile manufacturers in Detroit and additional round-lot orders from the Fisher Body plant in Cleveland which manufactures the Chevrolet bodies permitted this increase in operations.

The 41 per cent rate of production was reached only during one week last year, early in March.

Considerable other sheet tonnage for February requirements was divided among Ohio mills by automobile manufacturers the past week. Some of the makers of forgings and other automobile parts in this territory have been benefited by new orders from the same source.

Miscellaneous business in steel from other sources gained the past week with inventories completed and stocks at rock bottom. Many consumers placed orders for bars, plates and shapes in small lots for early requirements, few of the orders exceeding 100 tons.

Railroads in this territory are working on their 1933 programs and rail requirements from two are expected this month. Miscellaneous orders for railroad track material show a slight gain.

An extensive program of Government breakwater work along the Great Lakes is being worked on by the War Department and, should all the contemplated work be carried out with the use of sheet piling, approximately 55,000 tons of piling will be required.

New inquiry in the structural field is very light. The extensive road and bridge building program carried on in Ohio the past year is nearing completion and little new work is expected to come out during the first half of this year. In Michigan, an $8,000,000 road building program, involving considerable bridge work, is proposed for the current year.

Weakness that recently developed on sheets has resulted in a very unsettled price situation. Concessions of at least $3 a ton from the recent ruling price are being made on light cold-rolled sheets, which go mostly to the automotive industry. Wire products have also weakened.

Pig Iron

Shipments are holding up and are exceeding sales. Inquiry has again fallen off. A leading producer reports that shipments during the first half of January were 30 per cent larger than during the same period in December, most of the iron going to the automotive industry. Business with foundries in other fields continues very slack. New demand is confined mostly to carlots for early needs. Prices are unchanged and untested at $15 for foundry and malleable iron for local delivery. While quotations for outside shipment range from $14 to $14.50, the lower price could probably be shaded for delivery to competitive points.

Bars, Plates and Shapes

Demand for merchant bars shows a moderate increase, this resulting from a gain in orders from the motor car industry, and some of the mills report a slight improvement in plate and shape business from manufacturing consumers. The market is firm at 1.60c., Pittsburgh, for plates and shapes. Billet steel reinforcing bars range from 1.40c. to 1.50c., mill.

Strip Steel

Demand for hot-rolled strip is not holding up as well as that for sheets. Very little new business was placed during the week, and the tapering of specifications from the automotive industry previously reported is still in evidence. The price is firm at 1.45c, Pittsburgh. Cold-rolled strip continues very dull, with quotations unchanged at 1.90c to 2c, Cleveland.

Sheets

A fair volume of new orders was placed by the automotive industry with Ohio mills during the week and some new business came from the refrigerator and steel barrel industries.

Ore

Consumption of Lake Superior ore during December was 630,115 tons, a decrease of 66,216 tons from November and compared with 1,229,640 tons in December last year. Stocks in furnace yards and docks Jan. 1 were 31,489,671 tons, compared with 38,010,275 tons on the same date last year. There were 41 furnaces in blast using Lake ore Dec. 31, a decrease of four for the month.

Scrap

No new consumer demand has developed since the first of the year and in the absence of buying prices are nominal, but show no tendency to go below present low levels. A valley district consumer during the week released shipments of blast furnace scrap and a Cleveland consumer continues to take small lots of the same grade.

Railroads at St. Louis Ordering More Freely

ST. LOUIS, Jan. 17—Orders for carload lots continue to constitute virtually all of the new pig iron business. Shipping instructions against contracts are being received in sufficient volume to bring the January shipments of the local maker ahead of those of December. Only one of the malleable plants in the district is operating to any considerable extent. Stove plants in the outlying territory are said to be doing better than those in the district proper. Prices are unchanged.

Steel

Granite City Steel Co. reports business so far in January is somewhat better than the corresponding period in December and notes a very definite improvement in the current needs of railroads, which are ordering more freely.

Demand for tin plate looks good for the immediate future. Heavy products have continued to move slowly.

One of the local steel mills expects to resume on Jan. 23 the operation of two of its furnaces which have been idle for several weeks.

Scrap

Mills in the St. Louis industrial district have not resumed buying this year, and prices are nominally unchanged. Railroad lists: Chicago, Burlington & Quincy, 4000 tons; Southern Pacific, 500 tons of malleable.

Buffalo Steel Output Has Risen Slightly

BUFFALO, Jan. 17—No sizable pig iron inquiry is before the market, although a few users are inquiring for as much as 100 tons. The Bethlehem furnace at Lackawanna is now the only active stack in the district.

Steel

The Lackawanna plant of Bethlehem Steel has increased its operation to five open-hearths. Republic Steel probably will light two furnaces this week. Wickwire Spencer is operating one furnace and Seneca sheet division of Bethlehem is operating 18 to 20 per cent. A change in warehouse prices has been made on blue annealed sheets. Those below 48 in. wide are now quoted at 3.10c., and those above 48 in. at 3.25c.

Scrap

Releases on old orders on No. 2 heavy melting steel are still being made.

New York Steel Trade Has Shown Little Improvement

Lower Prices Quoted on Wire Products—Further Weakness on Sheets—Large Concession Given on Reinforcing Bars

NEW YORK, Jan. 17.—Fresh developments in the finished steel market are concerned mainly with prices. Recent cutting of prices on wire products has been formally recognized by some of the leading producers with outright reductions of $2 a ton or more on rods, plain wire, nails and other miscellaneous products. The plain wire price becomes 2.10c., Pittsburgh, the first change on this product since December, 1930. Nails are now at $1.80, base per keg.

Sheets have also shown further weakness, particularly galvanized sheets, which are now openly quoted at 2.65c. a lb., Pittsburgh, a decline of $4 a ton within two or three weeks, and some quotations of 2.60c. have appeared. Cold-rolled sheets, both heavy and light, are lower in price. Box annealed sheets are fairly steady at 2c. to 2.10c., Pittsburgh. The sheet price situation has become so chaotic that producers scarcely know what to quote to obtain an order.

Marked weakness has also cropped out in reinforcing bars, though merchant bars remain fairly firm at 1.60c., Pittsburgh. A leading producer has taken 500 tons of reinforcing bars from a New York district distributer at about 1.20c., Pittsburgh. The top of the Eastern plate market is now 1.60c., Coatesville, on the general run of business, with prices as low as 1.40c., Coatesville, having been made within the past week on fairly attractive lots. Only inconsequential tonnages are now being sold at 1.70c., the price that has been nominally in effect for some time. A reference in this report in the Jan. 12 issue to weakness in structural material referred particularly to fabricated material. Shapes are in a better price situation than most of the other products. Some recent low-priced "protections" to fabricators are said to have been withdrawn.

Foreign bars, which until recently have been quoted at about 1.20c. or 1.25c. a lb., duty paid, New York, are again becoming a more serious competitive factor. Offers have been made at about 1c. a lb., New York.

The Bethlehem Steel Co. was the only bidder on 6000 tons of rails required by the Board of Transportation, New York. Its bids were 1.95c. a lb. for main track rails and 2.48c. a lb. for guard rails, a total of $281,239.45.

The past week's steel orders in this district showed very little, if any, general improvement over those of the week before.

Pig Iron

Meager improvement in small-lot inquiry is discernible. The betterment, however, is spread too thin to be significant. More frequent carlot sales accounted for a slight boost in bookings, which last week totaled 1000 tons, compared with 700 tons the week before and 800 tons two weeks ago. Sellers are generally adhering to recent quotations. A slight relief from pressure of foreign competition is momentarily being experienced because of the more advantageous position of domestic furnaces to satisfy an almost invariable demand for rush delivery.

Reinforcing Bars

New projects that appeared during the week included a hospital at Baltimore, alteration work at the Walter Reid Hospital and new vaults and alterations at the Treasury Building, at Washington. Bar requirements for these jobs have not yet been figured. Lettings for the week were in better volume and included 600 tons for a State hospitals, Kings Park, N. Y.; 200 tons for road construction, Sullivan County, N. Y., and 650 tons for the custom house at Philadelphia.

Scrap

With several dealers actively bidding for No. 1 heavy melting steel to cover export orders, the price for that grade has firmed perceptibly. Little No. 1 steel is appearing at $4.50, on barge, while one dealer is offering $4.75, on barge. No. 2 heavy melting steel is still purchasable at $3, on boats. Aside from export movement of scrap, trading is rather quiet.

Bill Directs Government to "Buy American"

WASHINGTON, Jan. 17—The Wilson bill, which requires the purchase of domestic supplies and materials for Governmental use and for the construction and repair of Federal public buildings and works, was passed by the House of Representatives yesterday.

Opinion in the steel trade and the metal-working industry is generally favorable to the purposes of the Wilson bill. However, there is a feeling that its provisions are so sweeping as to make its application impracticable. It is provided that "only such unmanufactured articles, materials and supplies as have been mined or produced in the United States and only such manufactured articles, materials and supplies as have been manufactured in the United States *wholly* of articles, materials or supplies mined, produced or manufactured in the United States shall be acquired for public use."

It is pointed out that most manufactured products contain minor but essential ingredients or parts of foreign origin, and that it would be difficult and costly to substitute materials or parts from domestic sources. For example, the steel industry must use a certain amount of manganese, for which it is to a major extent dependent on foreign sources of supply. It is suggested that the bill be amended to allow a certain percentage of the component materials in manufactured products to be imported. A precedent for this is furnished by the Tariff Act of 1930 which provides that Philippine manufactures containing not more than 20 per cent foreign material (in value) may be admitted into the United States free of duty.

R.F.C. Approves Several Loans for Construction

WASHINGTON, Jan. 17.—New self-liquidating loans authorized by the Reconstruction Finance Corporation include the following:

To San Juan, Porto Rico, $1,300,000, to make improvements and extensions of municipal water system. Materials to be purchased in the amount of $800,000 include 80 miles of pipe, filter equipment, 15,000 meters and 400 hydrants, to be bought in the United States.

To Regents of University of Colorado, Boulder, $550,000, to build dormitory and refectory.

To Pensacola, Fla., $50,000, to make additions and improvements to waterworks system. Material to be purchased includes a 500,000-gal. elevated steel tank and approximately 475 tons of cast iron pipe.

To Riverton Pipe Line Co., Riverton, Utah, $20,000, to construct reinforced concrete storage reservoir and to make pipe replacements. Approximately $14,000 of material will be purchased, including 200 tons of cast iron pipe.

To Quincy, Fla., $16,000, to improve water system. Approximately $12,000 to be used for purchase materials, including 130 tons of structural steel, pumps and water softening units.

To Fabens Water Co., Fabens, Tex., $15,000, to improve and extend water distribution system. Approximately $10,500 to be spent for materials, principally well equipment, a 50,000-gal. steel tank and several miles of 6, 2 and 1-in. cast iron and galvanized pipe.

To Reeves County Water Improvement District No. 1, Balmorhea, Tex., $40,000, to make repairs to district's irrigation system. Loan of $5,000 to be made immediately for purchase of materials, chiefly steel reinforcing and cement.

Fabricated Structural Steel

Awards 8655 Tons—New Projects Total 67,100 Tons

FABRICATED steel awards, at 8655 tons, are in small volume, although heavier than a week ago when lettings of only 5700 tons were reported. The total of new projects is large, totaling 65,500 tons, compared with 4300 tons last week and with 29,833 tons two weeks ago. Most of the new tonnage that came into the market this week is accounted for by a single project—62,000 tons for the San Francisco-Oakland bridge, on which bids are to be taken March 2.

NORTH ATLANTIC STATES

State of New York, 105 tons, highway bridge in Cattaraugus County, to Lackawanna Steel Construction Corpn.

State of New York, 180 tons, highway bridge in Genesee County, to Lackawanna Steel Construction Corpn.; previously reported to McClintic-Marshall Corpn.

State of New York, 265 tons, bridges, to Lackawanna Steel Construction Corpn.

Comstock, N. Y., 220 tons, Great Meadow prison buildings, to Kellogg Structural Steel Co.

Elmira, N. Y., 325 tons, armory, to Pittsburgh Bridge & Iron Co.

New York, 465 tons, Bank for Savings building, to McClintic-Marshall Corpn.

New York, 175 tons, storage warehouse, 214 East Twenty-second Street, to Grand Iron Works.

Baltimore & Ohio Railroad, 700 tons, bridges on Staten Island, to American Bridge Co.

State of New York, 620 tons, highway bridge at Callicoon, to American Bridge Co.

State of New Jersey, 170 tons, highway bridge at Columbia, to McClintic-Marshall Corpn.

SOUTH AND SOUTHWEST

State of Tennessee, 300 tons, beam bridges at Memphis and Dyersburg, to Virginia Bridge & Iron Co., Inc.

State of Oklahoma, 580 tons, Red River bridge, Greer County, to J. B. Klein Iron & Foundry Co.

State of Oklahoma, 450 tons, highway bridge in Pottawatomie County, to J. B. Klein Iron & Foundry Co.

Okemah, Okla., 550 tons, highway bridge, to Kansas City Structural Steel Co.

Kingfisher and Comanche counties, Okla., 100 tons, bridge, to J. B. Klein Iron & Foundry Co.

Stephens County, Okla., 550 tons, bridge at Loco, to J. B. Klein Iron and Foundry Co.

Eddy County, N. M., 435 tons, two Federal projects, to an unnamed bidder.

Fort Worth, Tex., 190 tons, heaters for Sinclair Refining Co., to Lackawanna Steel Construction Corpn.

CENTRAL STATES

Fernbank, Ohio, 200 tons, rolling lock gates, to Midland Structural Steel Co.

Starke-LaPorte Counties, Ind., 200 tons, State highway bridge, to American Bridge Co.

Lansing, Mich., 100 tons, post office, to Jarvis Engineering Co.

State of Illinois, 490 tons, highway bridges at Chester and Red Bud, to Vincennes Bridge Co.

Knox County, Ill., 200 tons, highway bridge, to Midland Structural Steel Co.

Springfield, Ill., 1500 tons, dam, to Mississippi Valley Structural Steel Co., previously reported as 520 tons.

Springfield, Ill., 125 tons, garage, to Mississippi Valley Structural Steel Co.

Iron Mountain, Mich., 500 tons, bridge for State of Michigan, to Lackawanna Steel Construction Corpn.

Falls City, Neb., 500 tons, bridge, to Omaha Steel Co.

WESTERN STATES

San Diego, Cal., 120 tons, quay wall and crane track, to Virginia Bridge & Iron Co., Inc.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Gowanda, N. Y., 2500 tons, State Homeopathic Hospital; C. F. Haglan & Sons Co. and Winston Brothers, Minneapolis, awarded general contract on joint low bid.

New York, 9000 tons, Federal court house superstructure; James Stewart & Co., Inc., New York, low bidder for granite structure; N. P. Severin Co., Chicago, low bidder for limestone structure.

Baltimore, 2000 tons, hospital for University of Maryland; new bids being taken.

Easton, Md., 900 tons, State highway bridge; Sanford Brooks, Baltimore, low bidder on general contract.

THE SOUTH

Clarksville, Va., 610 tons, bridges over Dan and Staunton rivers.

State of Kentucky, 200 tons, United States Lock and Dam No. 1 in Barren River.

CENTRAL STATES

Keokuk, Iowa, 700 tons, highway bridge over Des Moines River.

Iron Mountain, Mich., 450 tons, Interstate highway bridge; Lackawanna Steel Construction Corpn., low bidder.

WESTERN STATES

Southern Pacific Railroad, 600 tons, girder spans at Surf, Cal.

San Francisco, 165 tons, San Francisco-Oakland bridge, East Bay substructure involving 21 piers between Yerba Buena Island and Oakland, contracts 4 and 4A; bids March 2.

San Francisco, 62,000 tons, San Francisco-Oakland bridge. West Bay superstructure between San Francisco and Yerba Buena Island, contract 6; bids March 7.

FABRICATED PLATE

AWARDS

Chicago, 430 tons, three oil barges for United States Engineer, to Midland Barge Co.

Seattle, 200 tons, lighthouse tender Hemlock, to an unnamed bidder.

Northern Pacific Railroad, 930 tons, tie plates, to Pacific Coast Steel Corpn.

Los Angeles, 100 tons, special 2960, to Western Pipe & Steel Co.

Hamilton Field, Cal., 150 tons, standpipe, to Pittsburgh-DesMoines Steel Co.

Milwaukee, 500 tons, repairs to brewery.

Denver, 200 tons, eight welded plate cylinder gates for Hoover Dam; bids Jan. 27.

Pipe Lines

Natural Gas Pipe Line Co. of America, Inc., 20 North Wacker Drive, Chicago, plans steel pipe line in Des Moines, Muscatine, Louisa, Johnson, Henry and Lee Counties, Iowa, about 95 miles.

United States Engineer Office, P. O. Box 667, Vicksburg, Miss., asks bids until Jan. 31 for 40 sections ⅝-in. flange welded steel discharge pipe, each section 30 ft. long (Circular 162).

Buckeye Pipe Line Co., Killbuck, Ohio, C. M. Jackson, district manager, plans 4-in. steel oil pipe line from point near Blissfield to Walhounding River, Warsaw, Ohio, about 11 miles.

John W. Moore Construction Co., Lubbock, Tex., plans natural gas steel pipe line for main supply and smaller steel pipe for local distributing system. Work will begin in three to four months.

United States Engineer Office, First District, New York, asks bids until Jan. 24 for two steel suction pipes, 19½ in. inside diameter, 8 ft. long (Circular 174).

Seattle has awarded contract for 1800 tons of welded pipe for seventeenth avenue N. E. pipe line to Hydraulic Mfg. & Supply Co., which has purchased pipe through Barde Steel Co.

Vancouver, B. C., has awarded 450 tons of steel pipe to Dominion Bridge Co.

Reinforcing Steel

Awards 3325 Tons—New Projects 3150 Tons

Kings Park, N. Y., 600 tons, State hospital, to Kalman Steel Corpn.

Sullivan County, N. Y., 208 tons, road construction, to National Bridge Works.

Rochester, N. Y., 100 tons, State hospital, to Joseph T. Ryerson & Son, Inc.

Philadelphia, 650 tons, custom house, to Concrete Steel Co.

Elmira, N. Y., 475 tons, reformatory, to George R. White, Inc., New York, through William F. Hendrich Co., Cleveland, general contractor.

State of Pennsylvania, 100 tons, Bethlehem pike, to Kalman Steel Corpn.

Montgomery, Ala., 300 tons, State bridge work, to Dudley Bar Co.

State of Arizona, 100 tons, three highway projects, to various bidders.

State of Nevada, 200 tons, highway paving in three counties, to various bidders.

State of Wyoming, 100 tons, highway structures in six counties, to various bidders.

San Diego County, Cal., 135 tons, State highway structure over Chocolate Creek, to an unnamed bidder.

Sacramento, 125 tons, William Land school, to Truscon Steel Co.

San Diego, 100 tons, quay wall at Navy Base, to an unnamed bidder.

San Joaquin County, Cal., 121 tons, State highway paving between Mateca and Mossdale, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Gowanda, N. Y., 500 tons, State Homeopathic Hospital; C. F. Haglan & Sons Co. and Winston Brothers, Minneapolis, awarded general contract on joint low bid.

Baltimore, unstated tonnage, University of Maryland general hospital; bids opened Jan. 17.

Washington, unstated tonnage, alterations Walter Reid Hospital.

Washington, unstated tonnage, vaults and alterations Treasury building; bids Jan. 30.

Fort Sill, Okla., 900 tons, Government barracks.

San Francisco, 1140 tons, San Francisco-Oakland bridge, East Bay substructure involving 21 piers between Yerba Buena Island and Oakland, contracts 4 and 4A; bids March 2.

San Francisco, 1100 tons, San Francisco-Oakland bridge, West Bay super-structure, between San Francisco and Yerba Buena Island, contract 6; bids March 7.

Cast Iron Pipe

Boston closed bids Jan. 18 on 1200 tons of 8 to 16-in. class B. Previous bids were thrown out.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Jan. 30 for 1100 ft. corrugated perforated iron pipe (Circular 324).

Chicago, 8000 tons, water pumping station and connections with old stations.

La Habra, Cal., has awarded 500 tons of 4 to 12-in. to American Cast Iron Pipe Co.

Pasadena, Cal., will take bids Jan. 24 on 1215 tons of 6 to 30-in.

Copper Buying Abroad Increases; Tin Higher; Zinc Lower; Antimony Up

NEW YORK, Jan. 17.

TRADING in the domestic copper market was uneventful throughout the week. Factors auguring an early change from the current dull situation are lacking. Unfilled contracts and electrolytic stocks in consumers' hands, together with large producer and smelter supply, cause a slack that will be taken up only by a broad resumption of industrial activity. The paucity of consumer interest, however, so far has failed to adversely affect the Connecticut basis for electrolytic, which is unchanged at 5c. a lb. for first quarter and 5.12½c. for second quarter. In contrast with the apathetic market here, buying abroad during the week was relatively brisk. Moderate bookings today were reported by one seller at 5.05c., c.i.f. Continental ports, while other foreign offerings were available at 5c. Early last week the foreign market ranged down from 5.20c. to 5.05c. Foreign buyers are inquiring in the domestic market for copper scrap, but such material is said not to be available for export shipment. According to trade reports, European requirements of copper are understood to have averaged about 50,000 a month during the latter half of last year, while American needs have approximated only half that amount in the same period.

Tin

A limited demand for spot Straits tin prevailed during the week. Chinese 99 per cent metal claimed some buying interest. Strengthened by rising values in the London market, the New York price of spot Straits on Jan. 11 jumped to 22.95c., the highest level attained since Nov. 23. Later in the week, however, the New York market gave way in sympathy with receding quotations abroad, falling yesterday to 22.40c. and recovering today to 22.70c. A slight drop for the week occurred in London quotations, which today were £145 5s. a ton for spot standard, £145 15s. for future standard and £150 10s. for spot Straits. The Singapore market also fell off, with today's price £149 10s. A 175-ton decrease last week brought United Kingdom warehouse stocks down to 29,228 tons. Shipments from the East in the first half of January totaled 2403 tons.

Lead

Buying is chiefly in meager amounts for immediate delivery. The volume of January bookings has not measured up to preliminary estimates and, based on present indications, the latter half of the month will probably not show a notable increase in contracting. The restricted calls for February metal reflect an even greater hesitancy on the part of consumers to cover ahead. Notwithstanding the sluggish trading, prices are apparently being held firmly at 2.87½c. a lb., St. Louis, and 3c., New York.

Zinc

Weakness in price developed early last week following reports of a sale by one interest at 3c. a lb., East St. Louis, equivalent to 3.37c., New York. Other smelters subsequently adjusted their prices accordingly, so that the current market is fairly well established at that level. A somewhat improved consumer interest accompanied the price revision, with the result that bookings in the past week aggregated slightly more than 1000 tons contrasted with only 270 tons in the preceding period.

Antimony

The Chinese Provisional Government last week placed an embargo for an indefinite period on exportation of antimony with the further stipulation that when the embargo is lifted a 10 per cent tax will be levied on exports of this metal. American consumers in consequence of this development are displaying keen interest, with the result that the price has reacted sharply upward to 6c. a lb. duty paid. Buying, however, has been very limited, as most consumers prefer to await further developments before covering at the advanced price.

The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 11	Jan. 12	Jan. 13	Jan. 14	Jan. 16	Jan. 17
Electrolytic copper, N. Y.*	4.75	4.75	4.75	4.75	4.75	4.75
Lake copper, New York	5.00	5.00	5.00	5.00	5.00	5.00
Straits tin, Spot, N. Y.	22.95	22.85	22.55	....	22.40	22.70
Zinc, East St. Louis	3.05	3.00	3.00	3.00	3.00	3.00
Zinc, New York	3.42	3.37	3.37	3.37	3.37	3.37
Lead, St. Louis	2.87½	2.87½	2.87½	2.87½	2.87½	2.87½
Lead, New York	3.00	3.00	3.00	3.00	3.00	3.00

*Refinery quotation; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6c. a lb., New York.
Brass ingots, 85-5-5-5, 5.50c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	24.50c. to 25.50c.
Tin, bar	26.50c. to 28.50c.
Copper, Lake	7.50c. to 8.50c.
Copper, electrolytic	7.25c. to 8.25c.
Copper, casting	7.00c. to 8.00c.
*Copper sheets, hot-rolled	13.62½c.
*High brass sheets	11.00c.
*Seamless brass tubes	13.25c.
*Seamless copper tubes	12.37½c.
*Brass rods	8.50c.
Zinc, slabs	4.37½c. to 4.87½c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	3.75c. to 4.25c.
Lead, bar	5.25c. to 6.25c.
Lead, sheets	6.75c.
Antimony, Asiatic	8.00 to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, ½ and ½	15.50c. to 16.50c.
Babbitt metal, commercial grade	21.00c. to 32.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	27.00c.
Tin, bar	29.00c.
Copper, Lake	6.125c.
Copper, electrolytic	6.125c.
Copper, casting	5.875c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.75c. to 4.00c.
Lead, bar	7.25c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	16.50c.
Babbitt metal, high grade	31.00c.
Solder, ½ and ½	16.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	3.75c.	4.25c.
Copper, hvy. and wire	3.50c.	4.125c.
Copper, light and bottoms	2.625c.	3.50c.
Brass, heavy	1.75c.	2.25c.
Brass, light	1.25c.	1.75c.
Hvy. machine composition	2.50c.	3.125c.
No. 1 yel. brass turnings	2.125c.	2.50c.
No. 1 red brass or compos. turnings	2.375c.	3.00c.
Lead, heavy	2.25c.	2.50c.
Zinc	1.25c.	1.625c.
Cast aluminum	3.75c.	5.25c.
Sheet aluminum	8.00c.	9.75c.

Railroad Equipment

Shipments of railroad locomotives in 1932 totaled 105 units as against 166 in 1931, according to reports received by Bureau of the Census from manufacturers. Unfilled orders at the end of December, 1932, totaled 73 locomotives, of which only one was of steam type. Shipments in December were six locomotives compared with eight in November.

Baracoa Southern Railroad & Dock Co., Baracoa, Cuba, recently organized as a subsidiary of International Fruit Corpn., Havana, Cuba, and 99 Hudson Street, New York, has secured right-of-way for 26-mile narrow gage railroad from Sabana to Playa Blanca, near Baracoa, in eastern part of Cuba. Work will include construction of engine and car repair shops, terminals, etc.

California Dispatch Line, has ordered three 10,000-gal. tank cars from American Car & Foundry Co.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.i.f. Pacific ports	2.10c.

Billet Steel Reinforcing
(as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.50c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.50c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.35c. to 1.45c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.86c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.6935c. to 1.7935c.
F.o.b. Coatesville	1.60c. to 1.70c.
F.o.b. Sparrows Point	1.60c. to 1.70c.
Del'd New York	1.798c. to 1.898c.
C.i.f. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.86775c.
C.i.f. Pacific ports (standard)	2.10c.
C.i.f. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lbs.
2000 (½% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill 1¼ in.	3.00c.
1-3/16 to 1¼ in.	2.50c.
1-9/16 to 1¾ in.	2.35c.
1-15/16 to 2⅞ in.	2.20c.
2-15/16 to 6 in.	2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	1.45c to 1.55c.
No. 10, f.o.b. Chicago mill	1.55c. to 1.65c.
No. 10, del'd Philadelphia	1.76c. to 1.86c.
No. 10 f.o.b. Birmingham	1.60c. to 1.70c.
No.10, c.i.f. Pacific Coast ports	2.17½c.

Hot-Rolled Annealed

No. 10, Pittsburgh	1.60c. to 1.70c.
No. 10, Chicago mills	1.70c. to 1.80c.
No. 10 Birmingham	1.75c. to 1.80c.
No. 10, Pacific Coast ports	2.32½c.
No. 10, wrought iron, Pittsburgh	3.60c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.00c. to 2.10c.
No. 24, f.o.b. Ch'go mills	2.10c. to 2.20c.
No. 24, del'd Philadelphia	2.31c. to 2.41c.
No. 24, f.o.b. Birmingham	2.25c. to 2.35c.
No. 24, c.l.f. Pacific Coast ports	2.85c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	1.90c. to 2.00c.
No. 10 gage, f.o.b. Chicago mills	2.00c. to 2.10c.
No. 10 gage, del'd Philadelphia	2.21c. to 2.31c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.30c. to 2.40c.
No. 20 gage, f.o.b. Chicago mills	2.40c. to 2.50c.
No. 20 gage, del'd Philadelphia	2.61c. to 2.71c.

Note: Automobile body stock and steel furniture sheets to be quoted henceforth on cold-rolled sheet base prices, with extras for drawing quality.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.65c. to 2.75c.
No. 24, f.o.b. Ch'go mills	2.75c. to 2.85c.
No. 24, del'd Philadelphia	2.96c. to 3.06c.
No. 24, f.o.b. Birmingham	2.80c. to 2.90c.
No. 24, c.l.f. Pacific Coast ports	3.50c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.70c. to 2.80c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.50c. to 2.60c.
No. 20, f.o.b. Pittsburgh	3.00c. to 3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.30c.
No. 28, Chicago mill	2.40c. to 2.50c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I. C.	14.90
40-lb. coating I.C.	16.70

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.45c.
All widths up to 24 in., Chicago	1.55c.
Cooperage stock, P'gh	1.55c. to 1.60c.
Cooperage stock, Chicago	1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	1.90c. to 2.00c.
F.o.b. Cleveland	1.90c. to 2.00c.
Del'd Chicago	2.20c. to 2.30c.
F.o.b. Worcester	2.20c.
Fender Stock, No. 20, gage, Pittsburgh or Cleveland	2.65c. to 2.75c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
(After Dec. 31, extras of 10c a 100 lb. on mixed and joint carloads, 25c on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.10c. to 2.20c.
Spring wire	3.10c. to 3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.80 to $1.95
Smooth coated nails	1.80 to 1.95
Galvanized nails	3.35 to 3.45

	Base per Lb.
Smooth annealed wire	2.35c. to 2.35c.
Smooth galvanized wire	2.60c. to 2.70c.
Polished staples	2.50c. to 2.60c.
Galvanized staples	2.75c. to 2.85c.
Barbed wire, galvanized	2.30c. to 2.40c.
Woven wire fence No. 9 gage, per net ton	$50.00 to $55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	55.00 to 60.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Wrought Iron Inches	Black	Galv.
⅛	51½	28½	⅛	+95	+142½
¼ to ⅜	57	34	¼ & ⅜	+5	+29½
½	62	49½	½	28	10½
¾	65½	55	¾	33	16½
1 to 3	67½	57	1 & 1¼	36	20½
			1½	40	22
			2	38	21

Lap Weld

2	61	50½	2	26	12½
2½ to 6	64½	54	2½ to 3½	33	18½
7 and 8	62	51	4 to 6	35	22
9 and 10	60	49	7 and 8	34	21½
11 and 12	59	48	9 to 12	31	16½

Butt Weld, extra strong, plain ends

⅛	48	33	⅛	+17	+49½
¼ to ⅜	53½	38½	¼ & ⅜	+7	+41
½	59	49½	½	28	12½
¾	63½	54	¾	33	17½
1 to 1¼	65½	56	1 to 2	39	23
2 to 3	66½	57			

Lap Weld, extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½ to 4	39	25
4½ to 6	62	53½	4½ to 6	38	24
7 to 8	58	47	7 & 8	36	22
9 and 10	51½	40½	9 to 12	26	13½
11 and 12	50½	39½			

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—4¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,00 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes
Cold-Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$40.00
Light (from billets), f.o.b. mill	30.00
Light (from rail steel, f.o.b. mill)	26.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16 in. and large	$2.40
Spikes, ½-in. and large	2.40
Spikes, boat and barge	2.60
Tie plates, steel	1.75
Angle bars	2.55
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex nuts, blank or tapped	75
Washers*...7.00c. to 6.75c. per lb. off list	

*F.o.b. Chicago, New York and Pittsburgh.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh, 75, 25 and 10	
Stove bolts in packages, Ch'go, 75, 25 and 10	
Stove bolts in pkgs., Cleveland, 75, 25 and 10	
Stove bolts in bulk, P'gh	85
Stove bolts in bulk, Chicago	85
Stove bolts in bulk, Cleveland	85
Tire bolts	60 and 10

Discounts of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	2.35

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

Discounts to Jobbers

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	80 and 25
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread, ¾ in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	80, 25 and 10
Upset set screws, sq. head, 1 in. dia. and smaller	75, 10 and 10
Upset set screws, 1⅛ in. and larger,	75 and 10
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. to 6-in., inclusive Pittsburgh	$26.00
Rerolling, 4-in. to 6-in., inclusive, Youngstown	26.00
Rerolling, 4-in. to 6-in., inclusive, Cleveland	26.00
Rerolling, 4-in. to 6-in., inclusive, Chicago	26.00
Forging quality, Pittsburgh	31.00
Forging quality, Youngstown	31.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

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Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$37.00
Cleveland	$7.00
Chicago	$8.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$1.75 to $2.00
Foundry, f.o.b. Connellsville prompt	2.50 to 4.25
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd.	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b., ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.00 to $1.15
Mine run coking coal, f.o.b. W. Pa.	1.10 to 1.25
Gas coal, ¾-in., f.o.b. Pa. mines	1.25 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.30 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.25
Gas slack, f.o.b. W. Pa. mines	0.35 to 0.45

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 2 distillate	4.00c.
No. 4 industrial	3.50c.

	Per Gal. f.o.b. Baltimore
No. 2 distillate	4.00c.
No. 4 industrial	3.50c.

	Per Gal. del'd Chicago
No. 2 industrial fuel oil	2.80c. to 2.90c.
No. 6 industrial fuel oil	2.45c. to 2.50c.

	Per Gal. f.o.b. Cleveland
No. 2 distillate	5.25c.
No. 4 industrial	4.75c.

REFRACTORIES

Fire Clay Brick

	Per 1000 High-heat Duty Brick	f.o.b. Works Intermediate Duty Brick
Penn.	$35.00	$25.00 to $30.00
Maryland	35.00	25.00 to 30.00
New Jer.	$44.00 to 57.00	
Ohio	35.00	25.00 to 30.00
Kentucky	35.00	25.00 to 30.00
Missouri	35.00	30.00
Illinois	35.00	25.00 to 30.00
Ground fire clay, per ton	4.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	5.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$40.40 to $41.40
4-in., del'd Chicago	43.40 to 44.40
6-in., and larger, del'd New York	35.30
4-in., del'd New York	38.30
6-in., and larger, Birm'ham	33.00
4-in., Birmingham	36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per Gross ton, f.o.b. Valley furnace:

Basic	$13.50
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	$14.50 to 15.00
Low phos., copper free	23.00 to 25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:

Basic	$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy.	$15.50
N'th'n No. 1 fdy.	16.00
Malleable, not over 2.25 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free.	25.00
Silvery, sil. 8 per cent.	23.67
Bess. ferrosil'n, 15 per cent.	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	$18.30 to 18.80
Southern No. 2 fdy. del'd.	14.56
Northern malleable, del'd.	18.30 to 18.80
Northern basic, del'd.	18.30 to 18.80

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

* Buffalo, No. 2, del'd east N. J.	$17.41 to $17.66
East Pa. No. 2 fdy.	14.02
East Pa. No. 2 fdy.	14.52

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.
* Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy.	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd.	23.41

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N'th'n No. 2 foundry	$17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.00
S'th'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent.	21.87
Stand. low. phos., Valley	23.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 63c. average local switching charge; $3.12 from Jackson, Ohio; $0.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$13.34 to $13.84
East. Pa. No. 2X	13.84 to 14.34
East. Pa. No. 1X	14.34 to 14.84
Basic (del'd east. Pa.)	13.50 to 14.00
Malleable	14.74 to 15.04
Stand. low phos. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. b'r'g low phos. (f.o.b. furnace)	20.00 to 21.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are delv'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces; $4.07 from Virginia furnaces.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to 23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	68.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$24.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont., in carloads	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$30.50	14%	$33.50
11%	21.00	15%	24.00
12%	21.50	16%	25.00
13%	22.50	17%	26.50

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$18.00	12%	$20.50
7%	18.50	13%	21.50
8%	18.75	14%	22.50
9%	19.00	15%	23.00
10%	19.50	16%	24.00
11%	20.00	17%	25.50

Other Ferroalloys

Ferrotungsten, per lb. wu. del., carloads	94c.
Ferrotungsten, less carloads	$1.00
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained Va.	$2.60 to $2.80
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½% iron	9c.
Iron, basic or foundry, Swedish, average 65% iron	8c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	9c.
Manganese, Caucasian, washed 50%	*23c.
Manganese, African, Indian, 50-52%	*21c. to 22c.
Manganese, Brazilian, 46 to 48%	*19c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid	$10.00

	Per Gross Ton
Tungsten, domestic scheelite	$9.00 to $10.40
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	18.00

* Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois mines	$9.00 to $10.00
No. 1 lump, 85-5, f.o.b. Kentucky and Illinois mines	12.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	$16.00 to 16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	20.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.00 to $8.50
No. 2 heavy melting steel	7.00 to 7.50
No. 2 railroad wrought	8.00 to 8.50
Scrap rails	8.00 to 8.50
Rails 3 ft. and under	10.00 to 10.50
Sheet bar crops, ordinary	9.00 to 9.50
Compressed sheet steel	8.00 to 8.50
Hand bundled sheet steel	7.00 to 7.50
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	6.25 to 6.75
Short shov. steel turnings	6.25 to 6.75
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	8.50 to 9.50
Railr. knuckles and couplers	9.00 to 9.50
Rail, coil and leaf springs	9.00 to 9.50
Rolled steel wheels	9.00 to 9.50
Low phos. billet crops	10.50 to 11.00
Low phos. sheet bar crops	10.50 to 11.00
Low phos. plate scrap	9.50 to 10.00
Low phos. punchings	10.00 to 10.50
Steel car axles	11.00 to 11.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$5.00 to $5.50
Shoveling steel	5.00 to 5.50
Frogs, switches and guards	$5.00 to $5.50
Hydraulic comp. sheets	3.75 to 4.00
Drop forge flashings	4.00 to 4.50
No. 1 busheling	3.50 to 4.00
Rolled carwheels	6.75 to 7.25
Railroad tires	8.00 to 8.50
Railroad leaf springs	7.75 to 8.25
Axle turnings	4.50 to 5.00
Steel couplers and knuckles	7.00 to 7.50
Coil springs	8.25 to 8.75
Axle turnings (elec. fur.)	5.50 to 6.00
Low phos. punchings	8.00 to 8.50
Low phos. plates, 12 in. and under	8.00 to 8.50
Cast iron borings	3.00 to 3.50
Short shoveling turnings	3.25 to 3.75
Machine shop turnings	3.00 to 3.50
Rerolling rails	7.50 to 8.00
Steel rails, less than 3 ft.	8.25 to 8.75
Steel rails, less than 2 ft.	8.75 to 9.25
Angle bars, steel	7.00 to 7.50
Cast iron carwheels	7.75 to 8.25
Railroad malleable	5.50 to 6.00
Agricultural malleable	5.00 to 5.50
* Relaying rails, 56 to 60 lb.	15.00 to 17.00
* Relay rails, 65 lb. and up	18.00 to 23.00

Per Net Ton

Iron angle and splice bars	$5.00 to $5.50
Iron arch bars, transoms	5.00 to 5.50
Iron car axles	11.00 to 11.50
Steel car axles	9.00 to 9.50
No. 1 railroad wrought	4.50 to 5.00
No. 2 railroad wrought	4.50 to 5.00
No. 1 busheling	2.50 to 3.00

No. 2 bushelling	$2.00 to	$2.50
Locomotive tires, smooth	7.50 to	8.50
Pipe and flues	1.25 to	1.75
No. 1 machinery cast	6.25 to	6.75
Clean automobile cast	7.25 to	7.75
No. 1 railroad cast	5.75 to	6.25
No. 1 agricultural cast	5.75 to	6.25
Stove plate	5.50 to	6.00
Grate bars	6.25 to	6.75
Brake shoes	6.00 to	6.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.50 to	$7.00
No. 2 heavy melting steel	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Bundled sheets	4.00 to	4.50
Hydraulic compressed, new	5.50 to	6.00
Hydraulic compressed, old	4.00 to	4.50
Machine shop turnings	3.50 to	4.00
Heavy axle turnings	5.50 to	6.00
Cast borings	3.50 to	3.75
Heavy breakable cast	....	8.00
Stove plate (steel works)	6.00 to	6.50
No. 1 low phos. heavy	10.00 to	10.50
Couplers and knuckles	8.00 to	8.50
Rolled steel wheels	8.00 to	8.50
No. 1 blast furnace	3.50 to	3.75
Spec. iron and steel pipe	6.50 to	7.00
Shafting	12.00 to	13.00
Steel axles	12.00 to	13.00
No. 1 forge fire	5.50 to	6.00
Cast iron carwheels	8.00 to	8.50
No. 1 cast	8.00 to	9.00
Cast borings (chem.)	8.00 to	10.00
Steel rails for rolling	9.00 to	9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.00 to	$7.25
No. 2 heavy melting steel	6.25 to	6.50
Compressed sheet steel	6.00 to	6.50
Light bundled sheet stampings	4.00 to	4.50
Drop forge flashings	5.25 to	5.75
Machine shop turnings	3.25 to	3.50
Short shoveling turnings	4.00 to	4.50
No. 1 busheling	5.25 to	5.50
Steel axle turnings	5.00 to	5.50
Low phos., billet crops	10.00 to	11.00
Cast iron borings	3.75 to	4.00
Mixed borings and short turnings	3.75 to	4.00
No. 2 busheling	3.75 to	4.00
No. 1 cast	7.50 to	8.00
Railroad grate bars	5.00 to	5.50
Stove plate	5.00 to	5.50
Rails under 3 ft	8.50 to	9.00
Rails for rolling	8.50 to	9.00
Railroad malleable	6.75 to	7.00
Cast iron carwheels		8.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel		$7.25
No. 2 heavy melting scrap	$6.00 to	6.50
Scrap rails	6.00 to	6.50
New hydraul. comp. sheets	6.00 to	6.50
Old hydraul. comp. sheets		5.00
Drop forge flashings	6.00 to	6.50
No. 1 busheling	6.00 to	6.50
Hvy. steel axle turnings		6.00
Machine shop turnings	4.00 to	4.50
Knuckles and couplers		9.00
Coil and leaf springs		9.00
Rolled steel wheels		9.00
Low phos. billet crops	9.00 to	9.50
Short shov. steel turnings	5.50 to	6.00
Short mixed borings and turnings	3.75 to	4.25
Cast iron borings	3.75 to	4.25
No. 2 busheling	3.50 to	4.00
Steel car axles	10.00 to	11.00
Iron axles	10.00 to	11.00
No. 1 machinery cast	9.50 to	10.00
No. 1 cupola cast	8.50 to	9.00
Stove plate	6.50 to	7.00
Steel rails, 3 ft. and under	9.25 to	9.75
Cast iron carwheels	8.00 to	9.00
Industrial malleable	7.00 to	7.50
Railroad malleable	7.00 to	7.50
Chemical borings	7.50 to	8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.50 to	$8.00
Scrap steel rails	8.00 to	8.50
Short shoveling turnings		4.00
Stove plate		6.00
Steel axles		9.00
Iron axles		9.00
No. 1 railroad wrought	4.50 to	5.00
Rails for rolling	8.00 to	8.50
No. 1 cast		8.50
Tramcar wheels		8.50
Cast iron borings, chem.		8.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$5.50 to	$6.00
No. 1 heavy melting	5.00 to	5.50
No. 2 heavy melting	4.75 to	5.25
No. 1 locomotive tires	5.00 to	5.50
Misc. stand-sec. rails	5.25 to	5.75
Railroad springs	6.00 to	6.50
Bundled sheets	2.00 to	2.50
No. 2 railroad wrought	5.00 to	5.50
No. 1 busheling	3.50 to	4.00
Cast iron borings and shoveling turnings	2.75 to	3.25
Iron rails	7.00 to	7.50
Rails for rolling	6.75 to	7.25
Machine shop turnings	2.00 to	2.50
Heavy turnings	3.00 to	3.50
Steel car axles	8.50 to	9.00
Iron car axles	11.00 to	11.50
Wrot. iron bars and trans.	4.00 to	4.50
No. 1 railroad wrought	3.50 to	4.00
Steel rails less than 3 ft.	7.00 to	7.50
Steel angle bars	6.00 to	6.50
Cast iron carwheels	$5.00 to	$5.50
No. 1 machinery cast	6.50 to	7.00
Railroad malleable	4.00 to	4.50
No. 1 railroad cast	6.25 to	6.75
Stove plate	6.00 to	6.50
Relay, rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 60 lb. and over	20.00 to	21.00
Agricult. malleable	4.00 to	4.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.50 to	$4.75
No. 2 heavy melting steel		3.00
Heavy melting steel (yard)		1.50
No. 1 hvy. breakable cast	5.00 to	5.25
Stove plate (steel works)	2.50 to	2.90
Machine shop turnings	0.75 to	1.25
Short shoveling turnings	0.75 to	1.25
Cast borings	0.50 to	1.00
No. 1 blast furnace	0.50 to	1.00
Steel car axles	8.00 to	8.50
Spec. iron and steel pipe	2.50 to	2.75
Forge fire	2.75 to	3.00
No. 1 railroad wrought	4.00 to	4.50
No. 1 yard wrought long	3.25 to	3.50
Rails for rolling	5.00 to	5.50
No. 1 cast		4.50
No. 2 cast		4.50
Stove plate (foundry)		$4.50
Malleable cast (railroad)	$4.00 to	4.50
Cast borings (chemical)	6.00 to	6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast		$9.00
No. 1 hvy. cast (cupola size)	7.50 to	8.00
No. 2 cast	4.00 to	4.50

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$5.00 to	$5.50
Scrap rails for melting	6.00 to	6.50
Loose sheet clippings	1.00 to	1.50
Bundled sheets	3.75 to	4.25
Cast iron borings	3.00 to	3.50
Machine shop turnings	3.00 to	3.50
No. 1 busheling	4.50 to	5.00
No 2 busheling	2.75 to	3.25
Rails for rolling	6.50 to	7.00
No. 1 locomotive tires	7.00 to	7.50
Short rails	9.00 to	9.50
Cast iron carwheels	6.50 to	7.00
No. 1 machinery cast	8.25 to	8.75
No. 1 railroad cast	7.75 to	8.25
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Agricultural malleable	6.75 to	7.25
Railroad malleable	7.00 to	7.50

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$4.50 to	$5.00
Borings and short turnings	2.00 to	2.50
Long turnings	1.50 to	2.00
No. 1 machinery cast	7.75 to	8.25
Automotive cast	8.00 to	8.50
Hydraul. comp. sheets	4.00 to	4.50
Stove plate	3.00 to	3.50
New No 1 busheling	3.50 to	4.00
Old No. 2 busheling	1.50 to	2.00
Sheet clippings	1.25 to	1.75
Flashings	2.75 to	3.25

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	10.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	2.95c.
Squares and flats	3.45c.
Hoops and bands, under ¼ in.	2.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	3.10c.
Galv. corrug. sheets (No. 28), per square (less than 2750 lb.)	$3.74
Spikes, large	2.40c.
Small	2.65c. to 2.80c.
Boat	2.90c.
Track bolts, all sizes, per 100 count, 70 per cent off list.	
Machine bolts, 100 count, 70 per cent off list.	
Carriage bolts, 100 count, 70 per cent off list.	
Nuts, all styles, 100 count, 70 per cent off list.	
Large rivets, base per 100 lb	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.75
Wire, galv. soft, base per 100 lb	3.20
Common wire nails, per keg	2.35
Cement coated nails, per keg	2.35

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforc. bars, billet steel	1.35c to 1.40c.
Rail steel reinforcement	1.15c. to 1.25c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.00c.
Flats and squared	3.50c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.45c.
Galv. sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	2.75c.
Spikes (3/16 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural	3.75c.
Rivets, boiler	3.75c.

	Per Cent Off List
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., tap. or blank	65
Hot-pressed nuts, hex., tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75 and 10
Flat head bright wood screws	52½ and 10
Spring cotters	60
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$4.50 off list
No. 6 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

NEW YORK

	Base per Lb.
Plates and struc. shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	6.00c. to 6.50c
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.54c.
Flats and squares	4.04c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.30c.
Bands	3.30c.
Hot-rolled sheets (No. 10)	3.60c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel ⅛ x ⅛ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10

	Per 100 Ft.
Boiler Tubes:	
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	34.94
Charcoal iron, 4-in.	63.65

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.36c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10) up to and inc. 48 in. wide	3.00c.
over 48 in. wide	3.15c.
Black corrug. sheets (No. 24)	3.75c.
Gal. corrug. sheets	4.05c.
Structural rivets	4.00c.
Boiler rivets	4.00c.

	Per Cent Off List
Tank rivets, 7/16 in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.45c.
*Structural shapes	2.45c.
*Soft steel bars, small shapes, iron bars (except bands)	2.45c.
Reinforc. steel bars, sq., twisted and deform.	2.26c.
Cold-fin. steel, rounds and hex.	3.35c.
Cold-fin. steel, sq. and flats	3.85c.
*Steel hoops	3.00c.
*Steel bands, No. 12 to 3/16 in., incl.	2.75c.
Spring steel	5.00c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	3.75c.
*Hot-rolled annealed sheets (No. 10)	2.80c.
Diam. pat. floor plates, ¼ in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deductions on orders aggregating 4000 lb. or over.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	2.95c.
Cold-fin. flats and sq.	3.45c.
Flat rolled steel under ¼ in.	3.00c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No 24)	3.25c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb	$2.75
No. 9 galv. wire, per 100 lb	3.20
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rails steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.	3.32c.
Squares and flats	3.82c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb	10.35

	Per 100 Ft.
Seamless steel boiler tubes, 2-in.	$15.37
4-in.	34.57
Lap-welded steel boiler tubes, 2-in.	15.12
4-in.	32.96

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.20c.
Soft steel bars	2.95c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.50c.
Rounds and hex.	3.00c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.05c.
Bands	3.30c.
Hoops	3.95c.
Hot-rolled sheets (No. 10)	3.45c.
Com. wire nails, base per keg	$2.60
Illack wire, base per 100 lb.	3.25

BOSTON

	Per Lb.
*Beams, channels, angles, tees, zees	3.00c.
*H beams and shapes	3.00c.
*Plates—sheared, tank, and univ. mill, ¼ in. thick and heavier	3.00c.
Floor plates, diamond pattern	5.25c.
*Bar and bar shapes (mild steel)	2.90c.
*Bands 3/16 in. thick and No. 12 ga. incl.	3.40c.
Hoops, No. 14 ga. and lighter	4.90c. to 5.40c.
*Half rounds, hf. ovals, ovals and bevels	4.15c.
Tire steel, rd. edge 1½ x ⅛ in. and larger	4.50c.
Smaller sizes	4.75c.
Cold-finished rounds and hexagons	3.60c.
Cold-rolled strip steel	5.20c.
Cold-finished squares and flats	4.10c.
*Blue annealed sheets No. 10 ga.	3.15c.
One pass cold-rolled sheets No. 24 ga.	3.50c.
Blued stove pipe sheets No. 24 ga.	3.90c.
Galvanized steel sheets No. 24 ga.	4.00c.
Lead coated (long ternes) No. 24 ga.	5.00c.

*Base prices for 15,000 lb. orders, extras apply for smaller quantities.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	3.15c.	3.30c.	3.00c.
Soft steel bars	3.15c.	3.30c.	3.00c.
Reinforcing bars	3.00c.	3.00c.	3.00c.
Hot-rolled annealed sheets No. 24)	3.90c.	4.20c.	4.50c.
Hot-rolled sheets (No. 10)	3.75c.	3.50c.	4.00c.
Galv. sheets (No. 24)	4.55c.	4.50c.	5.00c.
*Struc. rivets, ⅛ in. and larger, less than 100 lb.	5.75c.	5.00c.	4.00c.
*Cold finished steel Rounds	5.50c.	5.50c.	4.50c.
Squares and hexagons	6.75c.	6.75c.	5.75c.
Flats	7.25c.	7.25c.	6.75c.

Nails—base per keg less carload:			
Com. 4-60d	$2.40	$2.40	$2.40
S. Box 4-20d	2.40	2.40	2.40
Finish 6 & 8d	2.40	2.40	2.40
All others	2.65	2.65	2.65

*Subject to deductions for quantity.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Mexican Petroleum Corpn., 122 East Forty-second Street, New York, an interest of Pan-American Petroleum & Transport Co., same address, is planning new oil refinery, including pipe lines, on 25-acre tract adjoining present asphalt refinery, East Brooklyn district, Baltimore. Cost over $1,500,000 with equipment.

Norge Corpn., 331 Madison Avenue, New York, manufacturer of electric refrigerators, with main plant at Detroit, has leased 12,500 sq. ft. floor space in building at 4331 Thirty-second Place, Long Island City, for new factory branch, service and distributing plant. Present branch in Long Island City will be removed to new location.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Jan. 23 for 60,000 ft. wire (Circular 43).

City Brewing Corpn., 912 Cypress Avenue, Brooklyn, has plans for extensions and improvements, including installation of equipment. Cost over $200,000. Frederick Paulsen is secretary and engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for one electric furnace (Schedule 9447) for New York Navy Yard.

Ruf Machine Co., Inc., New York, has been organized by Gustave W. Ruf, 365 East 198th Street, and Roman Ruf, 1655 Townsends Avenue, both Bronx, to manufacture machinery and parts.

North American Brewing Co., Wilson and Greene Avenues, Brooklyn, has plans for one-story top addition, with installation of new tanks, bottling machinery, conveying and other equipment. Total cost over $40,000. Allmendinger & Schlendorf, 1 Hanson Place, are architects.

Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, has secured orders for elevator installations in new Federal buildings in different parts of country, totaling $407,800, and will begin construction of car units and equipment at plants at Yonkers, N. Y. and Harrison, N. J.

Standard Spring & Mfg. Co., Inc., Brooklyn, has been organized by Frank J. Leidner, 9134 219th Street, Queens Village, L. I., and associates, to manufacture steel coil springs for locomotives, gas engines, valves, etc., and will take over Standard Spring & Mfg. Co., 236 Forty-second Street, Brooklyn.

Eisler Engineering Co., 760 South Thirteenth Street, Newark, N. J., manufacturer of electrical specialties, oil burners and mechanical equipment, has awarded general contract to Samuel Simon, 286 Renner Avenue, for new one-story plant at 39-43 Avenue L. Cost over $35,000 with equipment.

R. G. Smith Tool & Mfg. Co., 245 South Street, Newark, N. J., has recently developed a new gear and bearing puller for automobile service work, as well as other tool specialties, and has increased operations in tool-making divisions. Plant is now running on a five-day week.

Applicraft Corpn., West Orange, N. J., care of Charles M. Hosp, 1001 Springfield Avenue, Irvington, N. J., has been organized to manufacture metal cutouts and kindred metal products. Martin M. Bross, Jr., Newark, N. J., is one of organizers.

Eastwood Wire Corpn., 28 Joralemon Street, Belleville, N. J., manufacturer of steel wire for paper and other machinery, has been acquired by new interests, headed by Calvin H. Nealley, connected with Eastwood company for several years. New company has been organized under name of Eastwood-Nealley Corpn., to take over and operate plant.

Atlantic City Brewing & Ice Co., Atlantic City, N. J., recently organized to take over City Ice Co., 105 North Missouri Avenue, is planning expansion and modernization program at brewing plant. Cost over $200,000 with machinery. Charles Proebstle is president.

Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has arranged fund of $9,218,000 for extensions and improvements in power plants and system. Company has filed plans for addition to steam-operated electric power plant at Delaware Avenue and Lewis Street. Cost about $500,000 with equipment. United Engineers & Constructors, Inc., 1401 Arch Street, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for one motor-driven face mill grinder (Schedule 9453); until Jan. 31, one heat-treating electric furnace (Schedule 9323), 50 aircraft speed indicators (Schedule 9448), 100 aircraft supercharger pressure gages (Schedule 9450) all for Philadelphia Navy Yard

Harrisburg Gas Co., Harrisburg, Pa., is arranging an appropriation of $77,200 for extensions and improvements in plant and system, including pipe lines, etc.

Lackawanna Packing Co., Scranton, Pa., meat packer, has plans for one-story addition. Cost over $25,000 with equipment. Morris Frutchbaum, Scranton, is architect.

School Building Commission for John M. Clayton District, 4130 duPont Building, Wilmington, Del., William B. Chandler, chairman, asks bids until Jan 27 for manual training equipment for school at Frankford-Dagsboro, Del.

Acme Bearing Corpn., Buffalo, recently organized to manufacture ball bearings and kindred steel products, has leased factory at 1387 Niagara Street for new plant.

Board of Education, City Hall, Buffalo, asks bids until Jan. 24 for metal shelving, steel laboratory furniture and other equipment for public schools. James Storer is secretary.

Mangus Beck Brewing Co., Inc., Rand Building, Buffalo, recently organized with capital of $500,000 by Mangus A. Benzing, 285 Porter Avenue, and associates, to take over company of same name, is having plans drawn for new brewing plant. Cost over $175,000 with machinery. Julius C. Schultz, 1370 Main Street, is architect.

CENTRAL DISTRICT

Quaker State Oil Refining Corp., Oil City, Pa., has begun expansion and modernization program at refinery at Farmers Valley, Pa., to include new unit for gasoline production, steel tanks, pumping plant and other units. Cost over $350,000 with equipment.

Buckeye Producing Co., 1501 Michigan Street, Toledo, Ohio, is planning expansion and modernization at brewing plant. Cost over $100,000 with machinery.

Electric Auto-Lite Co., Champlain and Mulberry Streets, Toledo, Ohio, manufacturer of automobile starting and lighting equipment, has advanced production schedule and is now employing 900 workers.

Bruckmann Co., Ludlow Avenue and Rapid Transit, Cincinnati, has awarded general contract to D. Meinken & Son, 2143 Barnard Street, for extensions and improvements in brewing plant. Cost about $80,000 with equipment. Stewart & Stewart, 622 Broadway, are architects.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Jan. 23 for one arc welder (Circular 314); until Jan. 30, 4500 fuel and oil hose elbows, and 6000 hose and union nipples (Circular 319); aluminum alloy sheets (Circular 322); until Feb. 1, 363 propeller blades (Circular 316); 20 propeller hub assemblies, and propeller hub assemblies in lots of 21 to 200 (Circular 313); until Feb. 6, 278 streamline wheel assemblies, 278 stud axle assemblies and 278 brake assemblies (Circular 318); until Feb. 7, 2388 diagonal cutting pliers and 4111 adjustable wrenches (Circular 320); until Feb. 8, three motor-driven circular saws and one motor-driven metal-cutting saw (Circular 323).

Defiance Spark Plugs, Inc., 323 Twentieth Street, Toledo, Ohio, manufacturer of spark plugs and other automobile ignition equipment, has taken over property at Windsor, Ont., for new branch plant.

Truscon Steel Co., Youngstown, will increase production schedule at Pressed Steel Division plant, Cleveland, adding about 200 men to present working quota of 600. Company has secured order for steel refrigerator cabinets, totaling close to $2,000,000.

Home Brewing Co., 108 Third Street South, Canton, Ohio, recently reorganized with capital of $250,000, following inactivity for several years, is planning plant expansion and modernization, including additional machinery. Cost about $100,000. J. H. Foley and Frank Lisch head new company.

Sibley Machine Co., 206 East Tutt Street, South Bend, Ind., has awarded general contract to Edwards Iron Works, Inc., South Bend, for one-story foundry to replace unit destroyed by fire recently. Cost about $35,000 with equipment. F. D. Chase, Inc., 720 North Michigan Avenue, Chicago, is architect and engineer.

Blount Plow Works, Evansville, Ind., manufacturer of plows and other agricultural implements, has adopted full time production schedule of 8-hr. day, six-day week, giving employment to regular working forces.

Bennett Pump Corpn., Muskegon Heights, Muskegon, Mich., manufacturer of gasoline and other pumping equipment, a unit of Service Station Equipment Co., Conshohocken, Pa., has begun removal of plant to last noted place, where operations will be concentrated with those of parent organization.

Kellogg Co., Battle Creek, Mich., manufacturer of cereals, has awarded general contract through its subsidiary, Kellogg Co. of Canada, Ltd., to Piggott Construction Co., Hamilton, Ont., for new one-story plant unit at London, Ont., 50 x 105 ft., to be used in part as a machine division. Cost over $60,000 with equipment.

City Council, Lapeer, Mich., is considering installation of a municipal electric light and power distribution system. Cost over $150,000 with equipment.

Keystone Oil Refining Co., 10800 Northampton Avenue, Detroit, is planning to rebuild refinery recently destroyed by fire. Loss over $75,000 with equipment.

J. A. Fay & Egan Co., manufacturer of woodworking machinery, Cincinnati, has organized Fay-Egan Mfg. Co., a subsidiary, to take over manufacture of metal airplane propellers.

Tremblay Mould Co., Reading, Ohio, recently organized to manufacture molds for bottles and glassware, has taken over machine department of Nivison-Weiskopf Co., Reading, and has begun operations. E. Kerr is president; A. F. Tremblay, formerly connected with Overmyer Mould Co., Winchester, Ind., is secretary, treasurer and manager.

SOUTH ATLANTIC

Dixie Brewing Corpn., Rosslyn, Va., recently formed with capital of $2,000,000, has acquired about 4 acres improved with several buildings, near Lee Highway, and will remodel for new brewing plant. Cost over $300,000 with machinery.

Georgia Power Co., Atlanta, Ga., is considering extensions and improvements in steam-operated electric power plant at Brunswick, Ga., with equipment to double present capacity. Cost over $200,000 with machinery.

Procurement Division, Veterans' Administration, Washington, asks bids until Jan. 24 for one welding and cutting outfit (Proposal 292-M), 2-ton chain hoist trestle, straddle type (Proposal 298-M).

Maryland Tool Co., Baltimore, has been organized by Edward F. Lannon, 509 American Building, and associates, to manufacture tools and kindred mechanical equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for 120 electric generator equipments (Schedule 9434) for Brooklyn and Mare Island Navy Yards (Schedule 9434); bar steel (Schedule 9429), locks and latches (Schedule 9423) for Eastern and Western yards; until Jan. 31, 16 Scotch boiler furnaces (Schedule 9438) for Philadelphia, Norfolk and other yards; four pyrometer indicating thermo-electric type equipment and spare parts (Schedule 9456) for Brooklyn, Philadelphia, Mare Island and Puget Sound yards; 24 steam unloading valves and spare parts (Schedule 9457) for Brooklyn, Philadelphia and other yards; steam and superheater water drums for boilers (Schedule 9455) for Boston and Puget Sound yards; two full automatic direct indicating bench scales, one platform scale and four hanging dial scales (Schedule 9446), one foot-operated hand-feed eyelet machine (Schedule 9444) for Eastern and Western yards; 5652 ft. coil chain, 24,660 ft. weldless chain (Schedule 9441) for Brooklyn, San Diego, Mare Island and other yards.

Abbeville Power Co., Abbeville, S. C., recently organized by J. Roy Pennell, 134 Pine Street, Spartanburg, S. C., and associates, has plans for hydroelectric power plant on Rocky River, near Abbeville. Cost about $175,000 with transmission line. Mees & Mees, Court Arcade, Charlotte, N. C., are consulting engineers.

City Council, Wilmington, N. C., plans installation of pumping machinery, pipe lines and other equipment in connection with extensions and improvements in municipal water system. Cost about $135,000. J. L. Becton, Wilmington, is engineer.

General Supply Committee, Washington, ask bids until Feb. 1 for bolts, nuts, rivets, screws

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PITTSBURGH
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Pacific Coast Distributors—Columbia Steel Company, San Francisco, Calif.
Export Distributors—United States Steel Products Company, New York, N. Y.

washers, etc. (Class 43), brass, iron and steel pipe, galvanized conduit, boiler tubes, etc. (Class 44).

Poole Foundry & Machine Co., Woodberry, Baltimore, has appointed Frank M. Esch, P. O. box 742, Houston, Tex., as direct representative for the Poole line of flexible couplings and reduction gears in the State of Texas.

Poole Foundry & Machine Co., Woodberry, Baltimore, has appointed the Rockfield-Davis Equipment Co., 1500 Seventeenth Street, Denver, Colo., as its representative in the states of Colorado, Wyoming and New Mexico. The Denver company will carry a complete line of Poole flexible couplings in stock for distribution in its territory.

NEW ENGLAND

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Jan. 25 for superheaters, soot blowers, pipe, etc, for power house at Portsmouth, N. H., Navy Yard (Specification 7164).

Connecticut Electric Service Co., Hartford, Conn., has arranged fund of $2,047,738 for extensions and improvements in power plants, power substations, transmission and distributing lines this year.

Derby Steel Products Corpn., Derby, Conn., has been organized, capital $50,000, by B. L. Polkosnik, West Haven, Conn., and J. B. Tuttle, Branford, Conn., to manufacture steel specialties.

Wehle Brewing Co., Campbell Avenue, West Haven, Conn., has awarded general contract to National Construction Co., 1145 Chapel Street, New Haven, Conn., for one-story bottling works, 40 x 100 ft. Plans are also under way for another addition to brewing plant, formerly known as Weiderman Brewery. Entire cost over $50,000 with equipment. Brown & Von Beren, New Haven, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for 125,000 lb. bar hot rolled steel (Schedule 9443); until Jan. 31, two accumulator tanks for use in safety valve testing (Schedule 9435) for Boston Navy Yard.

New England Collapsible Tube Co., New London, Conn., manufacturer of metallic tubing, is running on full time schedule, with full working quota.

D. M. Dillon Steam Boiler Works, Inc., Fitchburg, Mass., recently organized, capital $100,000, to manufacture boilers and other plate products, will take over local company of same name. Fred N., Walter S., and D. Frank Dillon head new company.

MIDDLE WEST

Central Metallic Casket Co., 2004-12 West Lake Street, Chicago, manufacturer of metallic caskets and kindred metal products, has purchased three-story industrial building at Logan Boulevard and Holly Avenue for new plant for increased production. Later company plans addition on adjoining site to cost over $50,000 with equipment.

Seward Co., Inc., 600 West Jackson Boulevard, Chicago, has been organized by Ralph McClellan and George E. Ackerman, to manufacture machinery and parts.

Bear Mfg. Co., Fifth Avenue and Twenty-first Street, Rock Island, Ill., manufacturer of automobile garage and service station equipment, has rejected bids recently received for rebuilding one-story plant unit, 60 x 90 ft., damaged by fire, and will proceed with work by day labor. Benjamin A. Horn, Central Trust Building, is architect.

Superintendent, Pipestone Indian School, Pipestone, Minn., asks bids until Jan. 25 for cast iron thresholds and recessed floor bars, safety treads, stair railings, etc.

United States Engineer Office, St. Paul, Minn., plans early call for bids for construction of steel dredge, operated by Diesel engines.

Waage Mfg. Co., Chicago, has been organized to manufacture electric heating devices and kindred electrical products, and will take over Waage Electric Co., 5100 Ravenswood Avenue. Charles G. Hendricks and Kenneth E. Moverly are principal incorporators of new company.

Common Council, Blanchard, Iowa, is planning erection of a municipal electric lighting plant. Cost $39,500 with equipment. Appropriation voted.

Fairbanks, Morse Co., 900 South Wabash Avenue, Chicago, manufacturer of electric and steam power equipment, etc., has acquired through its subsidiary, Canadian Fairbanks, Morse Co., Ltd., Sherbrooke, Que., plant and business of Vilas Oil Burner, Ltd., Cowansville, Que., and will provide department for production of such oil burners and oil-burning equipment.

Milwaukee Gas Light Co., 626 East Wisconsin Avenue, Milwaukee, has announced appropriation of $595,000 for new construction and maintenance during 1933. Equipment and supply purchases will amount to $225,000. R. B. Brown is president and general manager.

Blatz Brewing Co., 1120 North Broadway, Milwaukee, has engaged George Lehle, architect and engineer, 502 Aldine Avenue, Chicago, to supervise plant improvements costing $1,500,000 or more and including new refrigerating machinery, tanks, etc. Initial construction contracts now being placed. Frank M. Gabel is vice-president and treasurer.

Underwood Veneer Co., Thomas Street, Wausau, Wis., which has started work on new sawmill at Bessemer, Mich., has plans for veneer plant, cut-up plant, planing mill and dry kilns, work to start about March 1. Total investment will be upward of $150,000.

Wisconsin State Engineers, State Capitol, Madison, Wis., are completing plans for new central heating plant costing about $65,000 at State Teachers' College, LaCrosse, Wis.

SOUTH CENTRAL

Nashville Gas & Heating Co., Nashville, Tenn., is arranging appropriation of $92,025 for extensions and improvements in plants and system, pipe lines, etc.

Citizens Promotion League of Campbell County, Newport, Ky., is at head of project to build municipal airport in western part of city, including hangars, repair shops and other field units. Cost over $80,000. John L. McDermott, architect, is member of committee in charge.

Haas Auto Parts Co., 608 West Broadway, Louisville, has been organized by Robert C. Haas, Jr., and associates, to manufacture automobile parts and equipment.

Hillerich & Bradsby Co., Finzer Street, Louisville, manufacturer of baseball bats, golf clubs, and other turned hardwood products, has acquired plant and business of Derby-Ball-Edwards Bat Co., Waterbury, Vt., manufacturer of kindred equipment. Waterbury plant will be removed to Louisville where capacity will be increased.

SOUTHWEST

Gasconade River Power Co., 605 R. A. Long Building, Kansas City, Mo., has plans for hydroelectric power development on Gasconade River, Phelps County, for which permit has been asked. Work will include power dam about 130 ft. high and 1800 ft. long, with generating plant of 60,000 hp. initial capacity. Project will cost over $10,000,000 with transmission lines.

Oklahoma City Gas Co., Perrin Building, Oklahoma City, Okla., John L. Hill, president, is negotiating for local franchise and plans installation of natural gas distributing plant and system. Cost over $500,000 with equipment.

Electrical Devices Co., St. Louis, recently organized, has acquired former plant of American Metal Products Corpn., Goodfellow Avenue, for manufacture of electric cooking utensils, including parts production and assembling.

Laclede Power & Light Co., 1017 Olive Street, St. Louis, has begun erection of new power substation. Cost over $200,000 with transformers, switch-gear and other power equipment.

Lum-Ray Mfg. Co., Kansas City, Mo., recently organized by T. A. Crooks and R. L. Ludwig, 3014 Linwood Boulevard, has taken over building at 1901 Wyandotte Street for manufacture of special paint products.

Jones Engineering & Mfg. Co., St. Louis, has been organized by James T. Jones, 4512 Cleveland Street, and associates, to manufacture mechanical products. Morris E. Jones, Webster Groves, Mo., will be an official of new company.

Constructing Quartermaster, Fort Sam Houston, San Antonio, Tex., asks bids until Feb. 8 for one-story repair and maintenance building, equipment storage and distributing building, and service and garage unit at Duncan Field. Appropriation of $90,000 has been arranged.

Marathon Oil Co., Tulsa, Okla., has approved plans for extensions and improvements in refinery at Fort Worth, Tex., including additional machinery. Similar program will be carried out at refinery at Bristow, Okla. Cost over $500,000 with equipment. Contract for cracking units for gasoline production has been let to M. W. Kellogg Co., Jersey City, N. J.

Board of Education, Kilgore School District, Kilgore, Tex., will take bids soon for new high school, with manual training department. Cost $200,000. Phelps & Dewees, Gunter Building, San Antonio, Tex., are architects; Emory S. White and Marvin E. DeFee, Henderson, Tex., are associate architects.

Common Council, Smithville, Tex., is considering a municipal electric light and power plant. Cost over $60,000 with equipment.

PACIFIC COAST

Vernon Brewing Co., Vernon, Cal., care of F. A. Linck, 917½ Dos Robles Place, Alhambra, Cal., engineer, recently organized, has asked bids on general contract for new brewing plant at Vernon, with power house, refrigerating plant and other units. Battery of 40 steel tanks will be installed. Cost about $175,000 with equipment.

United States Engineer Office, Sacramento, Cal., asks bids until Jan. 27 for 20,000-gal. capacity steel water tank on 70-ft. steel tower, at Rio Vista, Cal. (Circular 191).

Desert Power & Water Co., Kingman, Ariz., plans rebuilding part of power plant and waterworks recently destroyed by fire. Loss about $50,000 with equipment.

Public Works Officer, Navy Yard, Mare Island, San Francisco, asks bids until Feb. 15 for oil tanks for submarine repair base (Specification 7079).

Oliver M. Preston, 1603 East Sixth Street, Tucson, Ariz., is at head of project to build local brewing plant on South Twenty-fifth Street. Plans will soon be drawn for initial units, to include power house, pumping plant, refrigerating department, etc. Cost about $200,000 with machinery. Company will be organized to carry out development.

City Council, American Falls, Idaho, is planning new pumping plant for municipal water service, installation to include one 75-hp. and one 30-hp. engine-pumping units, with auxiliary equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for two power shovels and two drag shovel attachments (Schedule 9433), 100 pneumatic clipping hammers (Schedule 9439) for Mare Island Navy Yard; until Jan. 31, one 80-in. measuring machine (Schedule 9437), one motor-driven key-seating machine (Schedule 9449), one motor-driven metal-working shaper (Schedule 9436) for Puget Sound Navy Yard; eight extension ladders (Schedule 9445) for Mountain View, Cal., yard.

A. E. Stockburger, city manager of Alhambra, Cal., informs THE IRON AGE, that his city is not considering construction of a light and power plant as mentioned in these columns Dec. 15.

FOREIGN

Ketton Portland Cement Co., Ltd., London, England, is planning expansion and improvements at Ketton mills, including equipment to double present capacity. Cost over $350,000 with equipment.

Texas Corpn., 135 East Forty-second Street, New York, is considering new refinery in oilfield district, Argentine Republic, including power house, pumping stations, etc. Cost over $1,000,000. Socony-Vacuum Corpn., 26 Broadway, is interested in project.

Compagnie Francaise des Petroles, Paris France, has work under way on new oil refinery at Havre, France. Plant is scheduled for completion during summer, and will use crude oil from Iraq fields, Mesopotamia, where pipe line is now in progress. Cost about $750,000 with equipment.

People's Commissariat for Light Industry, Moscow, Russia, has authorized erection of two large factories at Tiflis and Cherkassy, for production of pianos and piano mechanisms. Cost over $1,000,000 with machinery. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

Lawrence Pump & Engine Co., Lawrence, Mass., has established an office in the Mart Building, Twelfth and Spruce Streets, St. Louis, in charge of George Myers.

H. A. Brassert & Co., 310 South Michigan Avenue, Chicago, engineers and constructors, have recently placed in service an Askania draft control on No. 4 open-hearth furnace of the Worth Steel Co., Claymont, Del. A similar control has been put in operation by the company on the billet heating furnace of the 10-in. merchant mill of the Youngstown Sheet & Tube Co. at East Chicago, Ind.

Kalman Steel Corpn. has removed its Buffalo office to the Lackawanna plant of the Bethlehem Steel Co., Hamburg Turnpike, Lackawanna, N. Y.

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"Bankocracy"—An Industrial Answer to "Technocracy"

(*Concluded from Page* 128)

drive down interest rates and these in turn are supposed to stimulate investment. The bond market has shown measurable improvement in recent months and possibly that improvement may extend to stocks. It is to be hoped that such will be the course of events. A rising stock market would help restore confidence, would appreciate the wealth of individuals and corporations and might result in new financing and in the release of many deferred orders for producer goods, thereby generating employment and consumer purchasing power.

Getting Credit Into the Hands of Consumers

It is possible, of course, that this formula will not work. It must be conceded that the steps taken so far have all been directed at building up credit reserves at the top. If this credit reservoir remains untapped, it may be necessary to put buying power directly into the hands of those who constitute the bulk of the purchasers of the goods of our industries—the ultimate consumers.

One suggested means of getting purchasing power into the hands of consumers is to inflate our currency. The country now has ample credit reserves, it is pointed out, but they are sterile, not supporting the business they are capable of. Moreover, because of the existence of large banking reserves, currency inflation, if properly controlled, would offer none of the serious dangers that exist in countries with inadequate or depleted reserves. It is countered that currency emission is an "artificial" expedient and that we have had sad experiences with artificial economic experiments. Yet it is difficult to understand why currency emission would be more artificial than the manufacture of credit through the hypothecation of property. Both currency emission and credit inflation are disastrous if not kept within bounds. And whether we like it or not, artificial devices may be imperative to restore the normal functioning of our credit economy. Artificial methods are frequently necessary to bring about recovery from physical ailments. Artificial respiration is resorted to in order to restore natural respiration. A convalescent who has forgotten how to walk must be retaught by artificial movement of his limbs.

A Choice Among "Artificial" Devices

In the present emergency mere labels have little meaning. It is likely that we shall soon face the necessity of choosing from a number of "artificial" methods. We shall have the choice of greatly increasing the Government deficit through direct relief to the idle or heavy expenditures for public works, of inflating the currency, devaluating the dollar or of mobilizing credit resources so that they will effectively bring about credit expansion.

Direct relief piles up the tax burden on industry without increasing taxpaying ability. Public works in sufficient volume to bring about industrial profits could not be gotten under way soon enough. Moreover, they would encourage waste and extravagance and would provide many facilities that the people don't want and don't need. A large increase in Governmental debt would disturb confidence and might cause another flight of gold from the dollar. Hence the road does not seem to lead to a badly unbalanced budget. On the other hand, the mere act of balancing the budget is no guarantee of business recovery—witness the case of Great Britain.

Popular Distrust of Currency Inflation

Currency inflation would be risky both because of deep-seated popular prejudice against it and because there would be no assurance that it would be kept within bounds. Devaluation of the dollar would alter our international trade relationships but cannot be counted on to bring about an advance in domestic prices.

A "Positive" Use of Credit

THE mobilization of credit for "positive" stimulation of consumption and production, rather than for "defensive" cushioning of the deflation, is the remedy that is most likely to appeal to industry. In the industrial countries of Europe national credit has been used to promote trade with Russia. According to this scheme, government credit is not extended directly to Russia but is used to underwrite the transactions of nationals with the Soviets. There is agitation for a similar Government guarantee fund for American trade with Russia, but there are serious doubts about the Soviet Union as a risk, particularly in view of the apparent breakdown of farm collectivization, and consequently industrial leaders are more favorable to the use of the same principle in connection with our domestic business. A way of applying a domestic guarantee fund has been outlined in a plan proposed by Fred I. Kent, New York banker, and recently recommended by Charles A. Miller, president of the Reconstruction Finance Corporation, in testimony before the United States Senate Committee on Manufactures. This scheme provides that industries making staple goods resume operations and reemploy men on the scale prevailing in 1927. The funds required would come from commercial banks under the supervision of the Reconstruction Corporation. The banks would be guaranteed by the Government against loss "for such portion of the loan as was not covered by the sale of the increased production."

This plan is, of course, an artificial method of bringing about a circulation and expansion of credit. It would have the advantage of getting buying power into the hands of consumers and of applying credit to normal productive purposes. The simultaneous increase in operations of complementary industries would, it is felt, create an inter-industry exchange that would persist once it got a good start. The reemployment of so many people would increase consumption, restore confidence, release credit, yield profits and strengthen prices, it is argued.

"Bankocracy" Is Industry's Real Nemesis

While the guarantee plan would be an experiment, industry is reaching a point where it realizes that something may have to be done besides listening to the "do nothing" counsel of reactionary economists. The self-perpetuating downward spiral of deflation must be stopped. When that is done, our banking authorities must be prepared to put on the brakes and to exercise much more rigid control of the credit machine than ever before in history. Such control is imperative because trade, industry and technology cannot thrive when the credit base is so unstable, so erratic as it has been in the past. Alternating floods and droughts make it impossible for the production man to get a steady yield or the maximum yield from the soil of invention, skill and social ingenuity.

Until our credit mechanism becomes more stable, it is futile to worry about such a minor social ill as technological unemployment. What we face today could be much more truthfully called financial or monetary unemployment. Before industry accepts blame for this depression, let it inquire into the major resposibility of the credit system. Before we worry about technocracy, let us get rid of "bankocracy."

Malleable Castings Gained in November

WASHINGTON, Jan. 17.—Orders for malleable castings in November of last year totaled 14,634 tons against 13,049 tons in October, according to reports received by the Bureau of the Census from 117 establishments. Shipments increased to 13,074 tons from 11,926 tons and production rose to 13,912 tons from 12,586 tons.

Orders, shipments and production in the first 11 months of 1932 and 1931, in tons, follow:

	Orders	*Shipments*	*Production*
1932	163,554	173,229	166,129
1931	282,711	305,764	290,350

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ROEBLING

THE CUSTOM-MADE WELDING WIRE—FOR EXACTING WELDERS

Threading Dies—Their Manufacture and Cutting Efficiency

(*Concluded from Page* 129)

released for production. In the course of manufacture this steel may show machining or hardening characteristics outside the usual, which were not observed in the acceptance tests. Subsequent tools being properly identified can be segregated, given a special heat treatment if necessary, or withdrawn from production if material is at fault.

Two Types of Chasers Used

There are two types of chasers most commonly used: (1) the tangential type and (2) the hob type. In the tangential type the threading dies have the threads milled or ground in the steel in the direction of bar rolling. The chasers, usually four to a set, are inserted in a die head and presented to the work so that the cutting edges are approximately on center. The thread of the die is in a tangential position to the work to be threaded. The hob-type die is presented to the work in such a way that the threads approximately follow the contour of the finished thread. The length of thread of the hob-type die, and consequently the number of regrinds possible, is much less than for the tangential type.

In the tangential die, the threads being milled on one side, and in the direction of bar rolling, are perforce located in the best possible metal of the bar. In many hob-type dies the threads are cut transversely to the direction of rolling, or in shop parlance across the grain. In the tangential die any possible ill effects of carbide segregation in the center of the bar are at a minimum. In the case of those dies where the threads are milled normal to the direction of rolling, or where some of the threads cross the carbide segregate, the quality of the thread may be impaired at this point. Consequently, high-speed steel intended for chasers where the threads are cut transversely to the direction of rolling must have little segregation of carbide.

We have found in the case of one type of inserted tap, requiring ¾ in. by 1½ in. high-speed steel, used for the internal threading of large pipe, that carbide segregation will produce a localized overheating on the points of those threads passing across the segregate. Cracks in the threads develop if segregation is bad. Examination of the microstructure around these cracks shows that massive martensite and needle martensite are invariably present on each side of the crack. The matter of harmful carbide segregation in this particular case was corrected through the cooperation of the steel mill which now furnishes this size of steel rolled from the lower 9 in. only of the small-end-down high-speed steel ingot. The solution in this case is really equivalent to the use of a smaller size ingot.

Successful performance of threading dies is dependent to a great extent on the hardness and toughness of the points or tops of the threads. Where great accuracy of finished bolt is demanded, as in automotive work, a small amount of dulling or chipping necessitates regrinding. This is not true of the general run of tools which still cut quite efficiently after a slight dulling of the edge or edges of the tool. Because of this, it is almost a by-word to those familiar with the manufacture and use of threading dies that a chaser is as good as the tips of the threads.

As the greatest number of threading dies are not ground all over after hardening, it is of the utmost importance that during heat treatment there should be a negligible absorption of carbon or a decarburization on the points or tops of threads. Cobalt in high-speed steels is notorious for its decarburizing action. Only through a relatively elaborate heat-treating procedure can cobalt high-speed steel threading tools be produced without a soft skin. Nickel also tends to cause high-speed steel tools to decarburize in heat treatment, although to a considerably less degree than that experienced with cobalt steels.

Savings From Proper Selection of Burner Equipment

(*Concluded from Page* 134)

saved by the furnace operator by not having to stop his work of charging the furnace for frequent adjustment of the burners. This, of course, enabled the operator to devote his entire time to properly charging the furnace.

Another example of the savings that can be made by the correct application of the proper equipment is well illustrated in the case of the Doehler Die Casting Co., of Toledo, Ohio, which recently converted all its die casting department to gas fuel.

The furnaces are constructed of 4½ in. of fire brick and 2 in. of insulating brick on all sides and bottom and are encased in a cast steel casing. The cast iron pots have a capacity of 300 lb. of aluminum alloy and the gooseneck holds about 18 lb. The pots weigh about 490 lb. each.

Each furnace is fired by a two-stage, high pressure burner utilizing city gas at 10 to 15 lb. pressure and automatically controlled. An increase in production per machine hour of 15 to 18 per cent was obtained due to the automatic control features relieving the operators from the necessity of taking production time to adjust the fires. Also considerable lost time was eliminated in the morning due to metal always being at the proper operating temperature when the operators arrived. The life of the pots were increased from an average of 11 weeks to an average of 16 weeks. The rejects caused by the metal being at improper temperatures have been practically eliminated.

Still another example of efficient engineering of burner equipment is in the case of a prominent steel company where a continuous producer gas fired billet heating furnace was converted to natural gas by the application of diffusion burners. A much lower B.t.u. input was obtained than on the previous producer gas fired furnace. In addition to this a much better and more uniform heating condition was secured resulting in a much higher quality product. This effected a very material saving.

These instances show very clearly the saving that can be made by a close study of the heating operations involved, analyzing the results desired, and applying the proper equipment to accomplish these results.

Several years ago it was realized that one type of burner is not suitable for all purposes. Gas combustion engineers have developed a wide range of burner equipment designed to efficiently handle almost any heating problem. To meet all conditions, 46 different types and more than 400 different sizes of burners are available. With this range of equipment to choose from and by giving some thought to the right application, there is not an industrial heating problem that cannot be made to work efficiently and in a great majority of cases effect a large saving.

Modern metallurgy will be the subject of an educational review course that will be sponsored by the Cleveland chapter of the American Society for Steel Treating and conducted by Prof. A. A. Bates, Case School of Applied Science. The course will consist of 12 lectures to be given from Jan. 30 to May 15 by Professor Bates; J. V. Emmons, Cleveland Twist Drill Co.; H. A. Schwartz, National Malleable & Steel Castings Co.; H. P. Croft, Chase Brass & Copper Co., and K. R. Van Horn, Aluminum Co. of America.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has received order for electric motors and control apparatus, valued at about $150,000, which will be used in rehabilitating some plants of a large sheet manufacturer.